

STAFF REPORT

PROPOSED REVISIONS TO
SECTION 303(d) LIST AND PRIORITIES FOR
DEVELOPMENT OF TOTAL MAXIMUM DAILY
LOADS (TMDLs)
FOR THE SAN FRANCISCO BAY REGION

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California Regional Water Quality Control Board
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Introduction

Under Federal Clean Water Act regulations, every two years the State is required to report to the U.S. EPA on the status of water quality in the State (Section 305(b) water quality assessment), and provide a list of impaired water bodies (Section 303(d) list). Impaired water bodies are those where water quality standards are not expected to be met after implementation of best available technology controls, which include municipal wastewater treatment plants. Water quality standards include designated uses, any narrative or numeric water quality objectives, and antidegradation, or maintenance of ambient water quality. The 305(b) and 303(d) actions provide the Regional Board a planning tool to identify waters where regulatory programs are not addressing water quality issues of concern to the public.

Once the water bodies are 303(d) listed, the State is required to determine the amount that the pollutants of concern must be reduced to meet the applicable water quality standard and eliminate beneficial use impairment. This allocation of allowable pollutant discharge from various sources is called a *total maximum daily load*, or TMDL. U.S. EPA specifies in its 1991 guidance that a TMDL has essentially two meanings:

- The TMDL process is used for implementing state water quality standards – that is, it is a planning process that will lead to the goal of meeting the water quality standards; and
- The TMDL is a numerical quantity determining the present and near future maximum load of pollutants from point and nonpoint sources as well as from background sources, to receiving water bodies that will not violate the state water quality standards with an adequate margin of safety. The permissible load is then allocated by the state agency among point and nonpoint sources.

A priority ranking for listed waters is required by federal regulations to guide TMDL planning. Preparation of a TMDL is normally a major staff workload, but the TMDL process is the logical way of addressing problems where pollutants, such as mercury, come from many sources, including wastewater, urban runoff, air sources, and abandoned mines. In this sense, the TMDL process becomes part of watershed management.

Federal regulations at 40 CFR 130.7(a)(5) specify that States must “evaluate all existing and readily available water quality-related data and information” when developing the 303(d) list. This requirement provides organizations and the public-at-large the opportunity to suggest changes to the 303(d) list based on recent physical, chemical, and biological data or information. Changes to the 303(d) list may include: (1) adding water bodies and pollutants to the list; (2) de-listing, or removing water bodies and pollutants from the list; or (3) refining the list, using recent data to indicate specific pollutants instead of pollutant classes (e.g., mercury in lieu of metals). This year’s public solicitation set forth the definition of what data and information are considered readily available by the Regional Board, listed in Appendix A.

Listing Process

For the State Board's 2002 303(d) list update, the Regional Board solicited information from the public to consider for the 303(d) list (Attachment A), to be provided by May 15, 2001. In that solicitation, the Board specified that only information generated since the last listing cycle (as early as July 1997) will be considered, unless such information had not been previously brought to the Board's attention in the preparation of the 1998 303(d) list. Beyond this general solicitation, agencies such as California Department of Fish and Game and the National Marine Fisheries Service were actively solicited for any new information to refine or augment the existing 303(d) list based on any new studies (none were identified). Various water districts with watershed monitoring programs were solicited for readily available information on water quality. The Department of Health Services was interviewed and sanitary surveys in its offices reviewed to identify any persistent surface water quality problems for drinking water supply sources (none were identified).

This unprecedented public solicitation resulted in 17 individual submittals by agencies and private organizations. Some of the submittals were technical reports focused on watershed assessment, such as fisheries habitat on a watershed scale or geomorphic assessment, some were raw data from water district or U.S. Geological Survey monitoring, and some were brief letters that referred to other studies as a basis for listing or de-listing. The submittals varied widely in content and magnitude, with the Waterkeepers of Northern California submitting the largest amount of technical reports and requests to list water bodies and pollutants/stressors. In total, the submittals included requests to list new water bodies and pollutants, to de-list water bodies and pollutants, and many submittals were simply spreadsheets with water quality data – some without any documentation of quality assurance and quality control (e.g., personnel training, confirmation analyses, or standard analytical or sampling procedures).

In California, it is important to recognize that all water monitoring and assessment is conducted in a decentralized manner. Only since 1990 has ambient monitoring received emphasis by the Regional Boards and U.S. EPA; effluent monitoring has been the programmatic focus since the Clean Water Act of 1972. In 1989 the California State Legislature added to and modified the California Water Code to establish the Bay Protection and Toxic Cleanup Program (BPTCP), which led to identification and characterization of "toxic hotspots" in the San Francisco Bay-Delta Estuary and plans for cleanup or other remedial or mitigation actions. The BPTCP final report in 1998 assessed the relationship between toxic pollutants in sediment and biological effects.

In the San Francisco Bay Region, dischargers to the San Francisco Bay-Delta Estuary contribute ambient monitoring funding to the San Francisco Estuary Regional Monitoring Program (RMP), which provides high quality data (i.e. well documented QA/QC and analytical protocols) on trace substances and various special studies. In 1998, the Regional Board used data from the RMP, initiated in 1993, to change the 303(d) list. No comparable effort exists in the watersheds of the San Francisco Bay Region, so

information on water bodies and water quality data collection designed for 305(b) water body assessment and 303(d) listing is extremely limited outside the estuary.

Indeed, ongoing watershed and beach monitoring by public agencies for assessment purposes is limited to drinking water reservoir areas (for public health, taste, and odor management) and bacterial monitoring of major water contact recreation areas. The Regional Board, municipal stormwater agencies, and some local watershed councils are working on development of watershed monitoring and assessment programs, but most are in early stages and do not have adequate funding to provide monitoring data at a spatial and temporal scale necessary for rigorous assessment. The quality and magnitude of the assessment of water quality information conducted for this 303(d) list update must be considered in the context of this loosely connected fabric of multiple monitoring efforts with multiple, site-specific assessment objectives.

The Regional Boards have been requested to provide recommendations to the State Board in Fall 2001 on the condition of Regional waters. The State Board will consider all Regional Boards' recommendations regarding the conditions of the Region's waters when formulating the 303(d) submission to U.S. EPA. The State's submission revising the list of impaired waters will be considered by the State Board in a public process to be conducted in early 2002. Opportunities for review of the State Board's proposed submission and public comment on the submission will be announced at a later date.

Approach to Listing Waters

The general factors used by the Regional Board staff to recommend changes to the 303(d) list for surface waters within the San Francisco Bay Region are summarized below. These listing considerations have been developed by representatives of different Regional Boards, State Board, and the U.S. EPA based on listing criteria recommended by U.S. EPA and used by numerous states, including Oregon, Washington, Nevada, and Arizona.

The Regional Board exercises caution in its decisions to recommend water bodies and pollutants/stressors on the 303(d) list, recognizing the context of the original statute. The Clean Water Act defines impaired water bodies as those navigable waters where water quality standards are not expected to be met after implementation of best available technology controls. The issues considered by the Regional Board consequently include (1) spatial and temporal extent of impairment; (2) consideration of tributaries or embayments; (3) seasonality of beneficial uses; and (4) whether technology has been implemented, especially with respect to nonpoint sources of pollutants or pollution, since point source control technology has been implemented in the San Francisco Bay Region. Some believe that municipal stormwater programs, in existence for 5 to 11 years, have had enough time to implement best management practices (BMPs) and that these controls are "in place" due to the regulatory program and any observed impairments should trigger immediate listing. Others, particularly municipalities, believe that the water quality benefits of urban runoff control technology and BMPs have yet to be realized and that listings should be delayed. Regional Board staff and legal counsel generally

advocate the former position, that conclusive evidence of impairment should trigger listing in 2002.

Implicit in a decision to list (or de-list) is a review of the persistence of impairing conditions across the water body in space and time. In the case of water contact use, spatial coverage may be limited to areas of public access, and temporal coverage limited to the dry season when the use exists and bacterial measurements are more representative of exposure. Environmental indicators such as dissolved oxygen, pH, fecal coliform, or metals in water provide measures of impairment where thresholds are specified in the Basin Plan or the California Toxics Rule. Watershed sediment or fisheries habitat studies provide measures of impairment when these studies demonstrate a departure from expected conditions for beneficial use support. Photo documentation of erosion, siltation, or trash is information the Regional Board can consider in an overall weight of evidence. The Regional Board will not list a water body based on a single or episodic event such as a spill or illicit discharge. There are other regulatory mechanisms to deal with these types of less persistent water quality problems, such as waste discharge requirements, cleanup and abatement orders, or general permits for construction or industrial stormwater discharges.

In instances where a mainstem water body in a watershed is listed for a pollutant/stressor, the tributaries are assumed to be impaired as well and would be analyzed eventually with respect to potential sources of pollutants in a TMDL. As such, it is redundant to list tributary water bodies, if the mainstem water body is already listed. The mainstem listing approach also provides a structure to address non-navigable portions of the water body system in a watershed, and prevents the unnecessary proliferation of TMDL processes that are obviously interrelated. This scenario applies to embayments, sloughs, channels, and lagoons within the larger estuary as well. The majority of requests for listing by environmental groups received during the public solicitation fall into this category. The Regional Board did not ignore the data submitted for consideration, but rather found that most of these waterbodies were already technically listed. Examples include bay toxic hotspots with elevated sediment concentrations of PCBs, mercury, and chlorinated pesticides, which are already listed, or similarly siltation and nutrient impairment evidence in tributaries of already-listed mainstems like the Petaluma River. The tributary-based listing approach does not apply to freshwater tributaries of estuarine or marine water bodies.

Beneficial uses of water bodies sometimes have an inherent seasonality, and this aspect is taken into account in the listing recommendations. For instance, there are different temperature sensitivities of various life stages of steelhead, such that a single year-round temperature threshold to assess cold freshwater habitat (or preservation of rare and endangered species) does not exist. Lakes and reservoirs that are mesotrophic and eutrophic, which is the case in the San Francisco Bay Region, stratify in the dry season, with less dense warm water (epilimnion) lying above colder water (hypolimnion). The line between these layers is known as the thermocline, which normally disappears in the wet season when the epilimnion cools and the lake mixes or “turns over.” During the dry season, mesotrophic and eutrophic lakes and reservoirs exhibit low dissolved oxygen

(DO) in the hypolimnion due to decaying planktonic matter (Goldman and Horne, 1983). Therefore only epilimnion DO is considered during the dry season. Similarly, water contact recreation (swimming or wading) for the majority of the public occurs during the dry season, with a few minor exceptions such as some specific portions of the ocean. In addition, bacterial indicators often lead to “false positives” due to naturally occurring non-pathogenic bacteria during the wet season, with soil or wildlife sources, and for these reasons dry season monitoring forms the basis of the most of the assessment for 303(d) purposes.

The Clean Water Act (CWA) also specifies that impairment determinations for water bodies occur after technology has been implemented, in the form of effluent limitations, to control pollutants. Before listing a water body and pollutant/stressor, the Regional Board must consider whether control measures specified under the CWA have been implemented, prior to determining if a water body is not attaining applicable standards (uses, objectives, and antidegradation). Since the original technology-based standards for point sources are based on technology, and are not water quality-based, the 303(d) list provides a mechanism to either improve point source controls further or identify and address the nonpoint sources that contribute to any water quality excursions.

Review of NPDES permitted discharges from industry and publicly-owned treatment works (POTWs) can be a straightforward exercise due to availability of effluent data, but review of the question of whether technology has been implemented to control urban runoff and nonpoint sources is more complex. This is complicated by a number of factors that are directly related to the nature of urban runoff and nonpoint source discharges. These include the nature of effective controls and the large area over which any controls must be implemented to be effective. NPDES permits have been in place for municipal stormwater programs of the San Francisco Bay Region for as long as 11 years. Therefore at this stage it is difficult to make a case that technology to control pollutants in urban runoff, best management practices (BMPs), has not been implemented. For this year’s 303(d) recommendations, including a preliminary list recommended by the National Research Council (NRC, 2001), the Regional Board is weighing these issues in a case-by-case manner.

A. Listing Factors

Water bodies and associated pollutants will be recommended for addition to the 303(d) list if any one of these factors is met:

1. Effluent limitations or other pollution control requirements [e.g., Best Management Practices (BMPs)] are not stringent enough to assure protection of beneficial uses and attainment of SWRCB and RWQCB objectives, including those implementing SWRCB Resolution Number 68-16 “Statement of Policy with Respect to Maintaining High Quality of Waters in California” [see also 40 CFR 130.7(b)(1)]. This does not apply to non-attainment related solely to discharge in violation of existing WDR’s or NPDES permit.

2. Fishing, drinking water, or swimming advisory currently in effect. This does not apply to advisories related to discharge in violation of existing WDR's or NPDES permit.
3. Beneficial uses are impaired or are expected to be impaired within the listing cycle (i.e. in next four years). Impairment is based upon evaluation of chemical, physical, or biological integrity. Impairment will be determined by "qualitative assessment", physical/ chemical monitoring, bioassay tests, and/or other biological monitoring. Applicable Federal criteria and the Regional Board's Basin Plan water quality objectives determine the basis for impairment status.
4. The water body is on the previous 303(d) list and either: (a) monitoring continues to demonstrate a violation of objective(s) or (b) monitoring has not been performed or is not of adequate quality or quantity to demonstrate that the impairment has been removed.
5. Data indicate tissue concentrations in consumable body parts of fish or shellfish exceed applicable tissue criteria or guidelines. Criteria or guidelines related to protection of human and wildlife consumption include, but are not limited to, U.S. Food and Drug Administration Action Levels, National Academy of Sciences Guidelines, U.S. Environmental Protection Agency tissue criteria.

B. Delisting Factors

Water bodies will be recommended to be removed from the list for specific pollutants or stressors if any one of these factors is met:

1. Objectives are revised (for example, Site Specific Objectives), and the exceedance is thereby eliminated.
2. A beneficial use is de-designated after U.S. EPA approval of a Use Attainability Analysis, and the non-support issue is thereby eliminated.
3. Faulty data led to the initial listing. Faulty data include, but are not limited to, typographical errors, improper quality assurance/quality control (QA/QC) procedures, or limitations related to the analytical methods that would lead to improper conclusions regarding the water quality status of the water body.
4. It has been documented that the objectives are being met and beneficial uses are not impaired based upon an evaluation of available monitoring data. This evaluation should discuss foreseeable changes in hydrology, land use, or product use and describe why such changes should not lead to future exceedance.

C. Evaluation Criteria

In general, the following hierarchy will be used in evaluating data relative to applicable water quality objectives:

1. Applicable numeric water quality objectives (contained in the San Francisco Bay Basin Plan) or water quality standards (contained in the federal California and National Toxics Rules). Both the Basin Plan and federal rules governing a specific parameter should be read carefully, since there can be site-specific applications or exceptions. For instance, many numeric objectives in the Basin Plan are oriented toward discharges (e.g., the temperature of any cold or warm freshwater habitat shall not be increased by more than 5°F above natural receiving water temperature). Also, numeric criteria often include a time element, such as duration of exposure (e.g., 4-day average for chronic metals concentrations) or number of samples within a given time period (5-sample geometric mean taken over 30 days for fecal coliform).
2. Criteria developed by the U.S. Environmental Protection Agency, California Department of Fish, and the California Department of Health Services and other applicable criteria developed by government agencies. Such criteria will be used to interpret narrative water quality objectives.
3. Guidance or guidelines developed by agencies/entities such as the U.S. Food and Drug Administration, National Academy of Sciences, and the Agency for Toxic Substances and Disease Registry and the California Department of Health Services. Guidelines developed by other agencies should be thoroughly reviewed before applied, since the assumptions and risk factors considered may not be consistent with Regional Board water quality objectives.
4. Criteria or standards developed in other states, regions, or countries. Such criteria should be used with caution. The environmental setting, assumptions, and risk factors considered may not be consistent with Regional Board water quality objectives.
5. Findings in peer-reviewed literature, listing decisions made in similar settings within the State, and/or “weight of evidence” based on information and evaluations performed by outside agencies or groups. Generally, a more extensive description will be needed to justify the impairment (or lack of impairment) determination. Clear links should be described between the literature, findings in similar settings, or outside evaluations and the non-attainment of water quality objectives.

There are no specific minimum data requirements or a specific frequency of exceedance for making a finding that water quality objectives are not attained. In general, more data are needed to interpret environmental results that are very specific to time and geography. Less data would be needed to make a determination based on environmental results that

serve as integrators over space or time. So more water column chemistry data would generally be needed to determine impairment than fish tissue chemistry data. Also less water column chemistry data may be needed to make an impairment determination (or lack of impairment determination) if there is other information to support the findings from the water column chemistry (e.g. correlations could be made between pesticide use patterns and the presence of pesticides in surface water).

D. Data Quality Evaluation

In order for any data to be evaluated against Basin Plan, California Toxics Rule, or other criteria, it must be of adequate quality and quantity to be representative of water quality standard attainment or impairment. Data quality evaluation is based on U.S. EPA Guidelines for preparation of 305(b) water quality assessment reports and the latest draft guidance from the Consolidated Assessment and Listing Methodology (CALM) (USEPA, 1996; USEPA, 2001).

These federal guidelines recommend a hierarchy of water quality data levels for evaluation of beneficial use attainment, particularly for aquatic life uses. The data hierarchy addresses data quality considerations such as (1) sample collection and analytical technique (grab, composite, series of grabs, or continuous), (2) spatial representativeness (locations in the watershed or water body), (3) temporal representativeness (frequency of sampling, number of seasons or years), and (4) quality assurance procedures (documentation of protocols, metadata, confirmation analyses, training). The data are rated according to "Level of Information" based on these considerations, which refers to the rigor of sampling and analysis, where 1 = Lowest, and 4 = Highest. However, even a short period of record can indicate a high confidence of impairment based on well-documented chemical data. Three years of data are not required to demonstrate impairment, for instance where high bacterial counts are recorded in areas of significant public water recreation during the dry season. All data reviewed for consideration for the 2002 303(d) list were ranked according to these recommended criteria, and only data of higher overall level of information were used to make 303(d) listings or de-listings. If data of lower level of information (1 to 2) suggested impairment, the water body/pollutant combination was recommended for the "preliminary" list, triggering more data or information collection for the subsequent listing cycle. In some cases, high quality data did not lead to listing due to lack of enforceable water quality objectives (i.e., sediment concentrations or biodiversity of macroinvertebrates).

E. Priority Ranking

A priority ranking is required for listed waters to guide TMDL planning pursuant to 40 CFR 130.7. TMDLs will be ranked into high, medium, and low priority categories based on:

- water body significance (such as importance and extent of beneficial uses, threatened and endangered species concerns and size of water body)
- degree of impairment or threat (such as number of pollutants/stressors of concern, and number of beneficial uses impaired)
- conformity with related activities in the watershed (such as existence of watershed assessment, planning, pollution control, and remediation, or restoration efforts in the area)
- potential for beneficial use protection or recovery
- degree of public concern and involvement
- availability of funding and information to address the water quality problem
- overall need for an adequate pace of TMDL development for all listed waters
- other water bodies and pollutants have become a higher priority

It should be noted that the criteria could be applied in different ways to different water bodies and pollutants. For example, a water body may be severely impaired, but if there is little likelihood of beneficial use recovery than a lower priority might be given. Staff also considered the overall need for an adequate pace of TMDL development for all listed waters, and if other water bodies and pollutants have become a higher priority. New listings were given a lower priority for TMDL development, to allow for early implementation actions already underway.

Schedules for TMDL development after the first two years should be regarded as very tentative. Completion will depend significantly upon the availability of funding, availability of staff, on watershed stakeholder group priorities, and RWQCB Basin Plan amendment priority. The schedules will also depend on further evaluation of the need for and feasibility of TMDLs. If additional water bodies and pollutants are listed in 2002 or subsequent 303(d) listing cycles these schedules will also need to be revised.

Information Received and Analyzed

Appendix A contains a summary of studies and data submitted to the Regional Board for consideration in the 303(d) listing process. Appendix A contains two tables: (1) a general summary of entities submitting information and the water bodies and parameters analyzed; and (2) a summary of data quality evaluation performed by Regional Board staff based on U.S. EPA guidance. As described above, the public solicitation process yielded a wide range of information, including many requests to list water bodies and pollutants, a few requests to de-list water bodies and pollutants, and a number of raw data sets without any request to list or de-list.

The public solicitation required staff to review all levels of information from approximately 90 water bodies throughout the region. Classes of pollutants and stressors considered included general water quality parameters such as dissolved oxygen, pH and temperature; metals; persistent organic pollutants (PCB's, PAH's, etc.); sedimentation/siltation; pathogen indicators; nutrients (nitrates, phosphates, and ammonia); total dissolved solids; chlorides; pesticides (diazinon and chlorpyrifos); lack of flow; habitat degradation (as indicated by macroinvertebrate surveys particularly in Marin County); trash including floatables; and radioactivity.

Assessment Methodology

Raw data were analyzed with respect to applicable water quality objectives in the Basin Plan or California Toxics Rule (CTR) for beneficial uses where they are either explicitly designated or otherwise where they unquestionably exist based on eyewitness accounts and other factors such as unrestricted public access. For impairment categories not easily quantified, such as sedimentation and trash, , a weight-of-evidence approach is used, as discussed below. Other considerations include fishing advisories issued since 1997 and effects-based listings associated with the Bay Protection and Toxic Cleanup Program (BPTCP) and associated remedial plans, mandated by the state legislature and completed in 1999.

Basin Plan and California Toxics Rule Criteria

The Basin Plan and the CTR contain certain numeric thresholds for some of the above-listed pollutants or stressors. Numeric thresholds include dissolved oxygen (DO), pH, ammonia, total coliform, fecal coliform, E. coli, enterococcus, and metals and organics in the CTR. Also, a number of parameters have thresholds for drinking water source protection, such as nitrate. Nitrate is an example of a pollutant that has an incomplete number of thresholds in the Basin Plan for all the beneficial uses it can affect. Even though excessive nitrate can cause impairment related to aquatic life or recreational uses associated with algal blooms and toxicity to aquatic life, the only threshold in the Basin Plan for nitrate is 10 mg/l as nitrogen to protect drinking water sources. Detailed site-specific information is necessary to assess whether nitrate is impairing recreation or aquatic life, and no such information is readily available in the San Francisco Bay Region.

The Basin Plan establishes a number of narrative objectives for surface waters for several parameters and categories of stressors, which essentially state that such parameters and stressors shall not cause nuisance conditions nor adversely affect beneficial uses. These parameters and categories of stressors include temperature, suspended and settleable material, oil and grease, biostimulatory substances, color, taste and odor, floating material, turbidity, sediment, sulfide, salinity, and population and community ecology. These parameters are typically evaluated under permitting or enforcement programs with respect to discharges, such as upstream and downstream, or pre- and post-project. Interpreting these narrative objectives for 305(b) and 303(d) assessment and listing

purposes is possible only if raw water quality data, photographs, or other information are accompanied by information that explains how the water quality information has departed from that expected to support beneficial uses.

Bay Protection and Toxic Cleanup Program

The BPTCP, authorized by the State Legislature in 1989, was an assessment and remedial program focused on sediment quality and biological effects in bays and estuaries throughout the state. It was a statewide program that sunset in 1999 after each Regional Board published final reports. The statewide information on bays and estuaries provides a robust context for evaluating impacts on beneficial uses in absence of formal sediment quality objectives. The weight-of-evidence approach employed by the BPTCP is explained in detail in the Final Technical Report (BPTCP, 1998). Portions of waterbodies identified in the BPTCP as toxic hotspots are classified as impaired based on severity of biological effects. The level of effort implementing remedial plans at the nine toxic hotspots is uneven – some are under the Regional Board’s regulatory orders that may lead to abatement of the impairment by the next listing cycle, while any remedial action at others is uncertain. Since causal determinations of impairment due to specific chemicals cannot be made without regulatory sediment quality objectives, 303(d) listing recommendations are effects-based.

Fishing Advisories

As discussed above under listing criteria, the Regional Board considers fishing advisories as a basis for 303(d) listing recommendations. In previous listing cycles, several pollutants have been added for the San Francisco Bay segments due in part to fishing advisories (e.g., mercury, PCBs, DDT, dieldrin, etc.), and Tomales Bay pathogens due to periodic shellfish harvesting closures related to high coliform counts and documented viral outbreaks.

Sediment

Sediment impairment assessment (impacts of sedimentation, siltation on beneficial uses) is much more complex than the standard comparison of water column measurements of turbidity or total suspended solids to numeric thresholds. A number of factors have to be assessed including predominant watershed geology, dynamics of sediment delivery to the stream, and beneficial uses sensitive to siltation, such as steelhead spawning (RARE, SPWN, COLD). Regional Board resources for sediment impairment assessment of streams, through the most recent listing, have not been sufficient. Therefore current listings are conservative with regard to resource protection, usually based on professional judgment, and strategic from the standpoint of bioregional conservation priorities.

Basis for Sediment Listings:

1. Consensus of professional scientists familiar with listed watersheds. Additionally, in Walker Creek and Lagunitas Creek, detailed scientific investigations have been performed (Haible, 1980; Hecht, 1992). In those cases, sediment listing is supported.

2. Listed basins suspected to be regionally significant from a conservation biology standpoint: critical habitat for native stream-riparian species assemblages.
3. Decline of threatened or endangered stream-riparian species is linked to habitat degradation.
4. Changes in sediment supply or transport capability are typically a component in habitat degradation.
5. Studies throughout northwestern California have document human-induced sedimentation and linkage to habitat degradation.
6. Precautionary principle: consequences of inaction, waiting to list until definitive data are available, are substantial. Political and economic consequences of false positive- listed and not impaired - are reasonable because: a) our technical approach emphasizes holistic aquatic species limiting factors assessment, as a first step in the TMDL, to insure that we focus on biologically significant watershed management problems; and b) state and federal resources are now available to develop quantitative limiting factors studies.

All larger streams in the San Francisco Bay Region, without exception, have sediment-related impacts such as downcutting, bank erosion, and sediment delivery from the hillslopes, due to over 150 years of intensive urban and agricultural land use. Historic human activities such as grazing, road construction, and agricultural clearing contribute fine sediments to channels throughout the region. The conclusions of sediment studies that more sediment is entering streams than pre-European settlement does not warrant a regulatory finding of impairment and sediment TMDL process – there must be an analysis that demonstrates a departure from an expected condition for beneficial use support. Regional Board staff acknowledges that urban streams throughout the region exhibit characteristics of entrenchment and bank erosion associated with increased imperviousness, and both urban and rural streams suffer other forms of habitat degradation associated with siltation of the bed. A regulatory impairment finding is not warranted based on the mere presence of sediment-related impacts, but rather in cases where significant sediment discharges threaten sensitive or important aquatic life resources. For instance, the conclusions of a recent Corte Madera Creek geomorphic report were that more sediment could be controlled than present (about 20%), but that control of these sources could lead to bed coarsening that would threaten beneficial uses (Smeltzer et al., 2000). Without a link to beneficial use protection, impairment findings cannot be made based on geomorphic studies alone.

A few streams not already on the 303(d) list were identified during the public solicitation process as potentially impaired due to sediment. These streams include Corte Madera Creek (Marin Bayside), Pilarcitos Creek (San Mateo Coastal), San Pedro Creek (San Mateo Coastal) and Novato Creek (Marin Bayside). After review of technical reports and consultation with sediment experts, only Novato Creek and Pilarcitos Creek warrant

consideration for 303(d) listing, considering the factors above, and is discussed below under “Threatened Impairments to Water Quality.”

Trash

The Regional Board has expressed in its Basin Plan that trash is a pollutant of concern. In Table 4-1, No. 7, the Basin Plan explicitly prohibits discharges of “rubbish, refuse, bark, sawdust or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plain areas.” Additionally, the narrative objective for floating material states that “waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.” As such, trash is a pollutant whose discharge to surface waters should be eliminated consistent with the Basin Plan and state and federal laws and regulations. Observations made by members of the public and Regional Board staff since 1997 indicate a preponderance of trash in, on and near water bodies, particularly in urban portions of streams, lakes, and coastlines throughout the San Francisco Bay Region. Thousands of tons of trash are removed from the Region’s water bodies by volunteers annually during Coastal Cleanup Day, organized by the California Coastal Commission.

Impacts of Trash on Beneficial Uses

Beneficial uses impaired by trash in urban streams, lakes, and coastlines include water contact recreation (REC1), non-contact water recreation (REC2), warm freshwater habitat (WARM), wildlife habitat (WILD), estuarine habitat (EST), marine habitat (MAR), rare threatened or endangered species (RARE), migration of aquatic organisms (MIGR), reproduction and early development of fish (SPWN), commercial and sport fishing (COMM), shellfish harvesting (SHELL), wetland habitat (WET), and cold freshwater habitat (COLD).

These beneficial uses throughout urban portions of the Region are affected by large accumulations of suspended and settled debris. The problem is more acute in bottom portions of watersheds and along the bay and ocean where debris flushed from upper reaches deposits and collects. Common items that have been observed by Regional Board staff include plastic bags, Styrofoam food/drink containers and packing materials, glass and plastic bottles, toys, balls, cans, cigarettes, plastic pellets, motor oil containers, antifreeze containers, construction materials, furniture, appliances, and Christmas trees.

Trash in water bodies causes significant water quality problems, and includes debris that floats and debris that settles. Small and large floatables can inhibit growth of aquatic vegetation, decreasing spawning areas and habitats for fish and other organisms. Floatable debris causes problems in the coastal watershed because it can easily come into contact with aquatic animals, people, boats, fishing nets, and other objects. Thousands of aquatic animals are caught in and strangled by floatable debris each year, and ingestion of various debris, especially plastics, commonly leads to malnutrition and starvation. Coastal communities also lose money when littered beaches must be closed or cleaned up, and the fishing industry and recreational and commercial boaters must spend

thousands of dollars annually for the repair of vessels damaged by floatable debris (U.S. EPA, 2001b).

Common settled debris includes glass, cigarettes, rubber, construction debris and more. Settleables are a problem for bottom feeders and dwellers and can contribute to sediment contamination. Some debris such as diapers, medical and household waste and chemicals, are a source of bacteria, viruses, and toxic substances. Floating debris that is not trapped and removed will eventually end up on the beaches or in the open ocean, repelling visitors and residents from the beaches and degrading coastal waters.

Wildlife impacts due to trash occur in creeks, lakes, estuaries, and ultimately the ocean. The two primary problems that trash poses to wildlife are entanglement and ingestion. Marine mammals, turtles, birds, fish, and crustaceans all have been affected by entanglement in or ingestion of floatable debris. Many of the species most vulnerable to the problems of floatable debris are endangered or threatened.

Entanglement results when an animal becomes encircled or ensnared by debris. It can occur accidentally or when the animal is attracted to the debris as part of its normal behavior or out of curiosity. Entanglement is harmful to wildlife for several reasons. Not only can it cause wounds that can lead to infections or loss of limbs, but it can also cause strangulation or suffocation. In addition, entanglement can impair an animal's ability to swim, which can result in drowning or difficulty in moving about, finding food, and escaping predators (U.S. EPA, 2001b).

Ingestion occurs when an animal swallows floatable debris. It sometimes occurs accidentally, but usually animals feed on debris because it looks like food, for instance plastic bags appearing like jellyfish, a prey item of sea turtles. Ingestion can lead to starvation or malnutrition if the ingested items block the intestinal tract, preventing digestion, or accumulate in the digestive tract, making the animal feel "full" and lessening its desire to feed. Ingestion of sharp objects can damage the mouth, digestive tract and/or stomach lining and cause infection or pain. Ingested items can also block air passages and prevent breathing, thereby causing death (U.S. EPA, 2001b).

Some elements of trash are more harmful to beneficial uses than others. Small pieces of plastic called "nurdles" may be among the most harmful floating material in aquatic systems. Nurdles are pre-production virgin material from plastic parts manufacturers, as well as post-production discards that are occasionally recycled. They float at various depths in the ocean and affect organisms at all levels of the food chain. As sunlight and UV radiation render plastic brittle, wave energy pulverizes the brittle material, with a subsequent chain of harmful effects on the various filter-feeding organisms found near the ocean's surface. Studies in the North Pacific Ocean indicate that both large floating plastic and smaller fragments are increasing. As a result of increased reports of resin pellet ingestion by aquatic wildlife and evidence that the ingested pellets are harming wildlife, the Interagency Task Force on Persistent Marine Debris (ITF) identified resin pellets, also known as plastic pellets, as a debris of special concern (USEPA, 1992). When released into the environment, these pellets either float on or near the water surface, become suspended at mid-depths, or may sink to the bottom of a water body.

Whether a specific pellet floats or sinks depends on the specific type of polymer used to create the pellet, additives to modify the characteristics of the resin, and the density of the receiving water.

Global scale impacts of discharges of plastic are just beginning to be understood. A 1999 study of marine debris in the mid-Pacific Ocean found that the mass of plastic particles collected was six times higher than the mass of plankton, although the number of planktonic organisms was five times higher than the number of plastic pieces. The even distribution of sampling points in the study design allows for an extrapolation to the breadth of the mid-Pacific Ocean. The number of plastic particles did not increase in successively smaller size classes as expected, indicating that there may be non-selective removal by mucus web-feeding jellies and salp. In this study, the most common type of identifiable particle, thin plastic film, accounted for 29% of the total. Birds, fish and marine mammals ingest the non-nutritive plastic, leading to untold numbers of starvation-related fatalities (Moore, 1999; Moore et al. 2000).

Trash in Waters of the San Francisco Bay Region

There are excessive levels of trash in virtually all urbanized waterways of the San Francisco Bay Region. Photo and video documentation on the status of trash levels for specific water bodies was submitted for the Regional Board's consideration during the public solicitation. The specific water bodies include Guadalupe River, Guadalupe Creek, Coyote Creek, and Silver Creek in Santa Clara County; San Leandro Creek, Glen Echo Creek, and Lake Merritt in Alameda County. Regional Board staff has noted trash in water bodies during initial field reconnaissance activities associated with the Surface Waters Ambient Monitoring Program (SWAMP) in March 2001, documented in field reconnaissance worksheets. The specific water bodies include the urban portions of San Pablo Creek, Wildcat Creek, Arroyo Las Positas, and San Leandro Creek (and all associated tributaries). Sometimes trash occurs in rural waterways, particularly in public access and recreation areas, but not in heavy accumulations such as those found at the bottom of urbanized watersheds. Notably, all information reviewed by Regional Board staff, including staff's field worksheets, is "snapshot" information, inadequate to make an assessment of trash occurrence in waterbodies over space and time, and therefore questionable as a basis for a regulatory impairment finding.

Regional Board staff reviewed site-specific data generated for Coastal Cleanup Day from Santa Clara, Alameda, Marin, Contra Costa, and Sonoma counties to evaluate whether such quantified information could yield a regional assessment of relative trash levels, as indicated by tons of trash removed, number of volunteers, and approximate upstream urban drainage area. Such a relative assessment could potentially yield a list of trash hot spots, but the data did not yield such a list. Review of this extensive amount of information showed that all urban areas have a substantial accumulation of trash and recyclable material, but that such data is not useful to perform regulatory assessments, since the amount of trash that is specifically detrimental to beneficial uses (such as plastic "nurdles") is not quantified, and the amount removed depends on so many factors (the productivity of each volunteer, the types of trash that volunteers select for removal, etc.). Observations, photo and video documentations, and Coastal Cleanup Day data together

provide a weight of evidence that not enough is currently being done to comply with the Basin Plan's Discharge Prohibition No. 7 (Table 4-1 of the Basin Plan).

Board staff believes there are three options for addressing trash in the 2002 303(d) listing process. First, the creeks for which data or information have been submitted could be listed. Second, all urban creeks could be listed based on the weight of evidence above. Third, given the "snapshot" characteristics of the information reviewed, the Regional Board could make a finding that trash threatens to impair water quality in all urban creeks, lakes, and shorelines, consistent with the recommendations for a preliminary list (NRC, 2001), and review actions of municipalities during the subsequent 303(d) listing cycle, according to conditions described below. Part of the challenge of carrying forward a listing recommendation this year is the lack of a consistent assessment methodology for trash "impairment," which requires some description of how beneficial uses are impaired, such as specific risks of wildlife ingestion and harm, or a linkage to aesthetic impact, and data are not currently collected this way on a water body basis. Additionally, not all trash is equally harmful to human health and aquatic life, and in urban environments where natural complexity of habitat has been removed for purposes such as flood control (e.g. woody debris), some elements of trash, while aesthetically unacceptable, actually benefit aquatic life by providing areas of slow velocity and cover (e.g., shopping carts). The U.S. EPA has released draft guidance for assessment of trash impacts (U.S. EPA, 2001b), which could provide a basis for trash impairment assessment activities carried out by the Regional Board and municipalities prior to the next 303(d) listing cycle.

Regional Board staff favor the third option, making a finding that trash threatens to impair water quality in all urban creeks, lakes, and shorelines, with conditions placed on municipalities to prioritize the implementation of the trash performance standard in the next two years. In this way, the municipalities that are diligently implementing trash discharge control, and therefore have relevant assessment information, will have the opportunity to demonstrate attainment of the water quality standard over space and time, and the 303(d) listings will be limited to areas where such control programs are either absent or deficient. This recommendation and its implications for the Regional Board and municipalities are described in more detail, below, under "Threatened Impairments to Water Quality."

Decisions to Not List

A large amount of water quality information reviewed by Regional Board staff did not lead to listing recommendations. In some cases, our data quality evaluation found a high "level of information," and yet did not recommend an impairment listing. Below are general rationales that explain the basis of these decisions to not list specific waterbodies and pollutants or stressors.

Urban Runoff Monitoring Data Analysis, 1988-1995

The Bay Area Stormwater Management Agencies Association (BASMAA) had a report prepared in 1996 summarizing several years of water quality data collected during storms in urban creeks of the region. For the 1998 303(d) list, the San Francisco BayKeeper petitioned the Board to list various urban creeks for copper, lead, mercury, nickel and

zinc, based on that report, and this year basically reiterated that 1998 request. At that time, the Board found that the data were inadequate and incomplete to support a finding of impairment, based on the following rationale, which is reiterated to clarify why the Board staff considers these “old data” that has already been considered in the past listing decision. The public solicitation in March 2001 was very clear about limiting this year’s review to consideration of data generated on or after July 1997, unless it was not previously brought to the Board’s attention.

Currently there are no water quality criteria that are specifically developed to address impacts of wet weather flows in urban creeks. Storm water samples were collected and reported as event mean concentrations and represent flow-weighted concentrations generally collected over a 6 to 36 hour period. Due to this short exposure period, comparison with the acute water quality criteria are the most appropriate indication of the potential for impairment of urban creeks from urban stormwater runoff.

Comparison of the dissolved metals concentrations (total concentration for mercury) in storm water runoff samples with the acute criteria is summarized below in Table 1. The comparison includes data collected during runoff events in twelve representative urban creeks over five years.

TABLE 1

COMPARISON OF SAN FRANCISCO BAY AREA URBAN RUNOFF WITH CALIFORNIA TOXICS RULE OBJECTIVES FOR SELECTED METALS

Metal	Number of Samples	No. of Samples Higher than Dissolved Acute Criteria¹	Percentage of Samples Higher than Acute Dissolved Criteria	Average Ratio of Sample to Criteria for Samples Above Criteria
Copper	150	6	4.0	1.9
Lead	157	0	0	0
Mercury	54	0	0	0
Nickel	35	0	0	0
Zinc	155	7	4.5	1.7

This comparison shows that none of the samples had lead, mercury, or nickel that were higher than the acute criteria. For copper and zinc, about four percent of the samples collected over six years of storm events had dissolved concentrations that were higher than the acute criteria. Examination of these individual samples indicated samples that are higher than the criteria are only slightly above the criteria. Moreover, in almost every case, the samples with elevated concentrations were collected in the initial phases of the

¹ Dissolved criteria for all metals except Mercury, which is evaluated using total concentrations, consistent with the California Toxics Rule.

monitoring program and may not represent current conditions. Samples collected in the latter part of the monitoring program were consistently below acute criteria.

The fact that exceedances of the acute criteria occur in storm events is cause for future monitoring to be integrated into urban runoff monitoring programs, particularly for copper (already on preliminary or “watch” list for the bay) and zinc, and particularly during non-storm events to document representative chronic exposures. Therefore, although ambient values are close to thresholds of concern, the board does not believe the data support a listing of specific urban creeks as impaired due to metals measured during storm events between 1989 and 1995.

Macroinvertebrate Data

The Regional Board, along with other Regional Boards, the State Board, and California Department of Fish and Game, is very interested in promoting the use of rapid bioassessment for evaluating whether waterbodies are impaired. To use macroinvertebrate or other bioassessment data, biocriteria must be developed according to state and federal water quality standard guidelines. There are presently no biocriteria for California that would enable this process. The Regional Board staff participates in the long-standing California Bioassessment Workgroup (CABW). Staff has initiated a watershed bioassessment monitoring program under SWAMP in 2001, and is coordinating with other local agencies in forming a Bay Area Bioassessment Workgroup to analyze the recently collected data in a regional context. This workgroup, which would report to the California workgroup at least annually, would facilitate the eventual development of biocriteria in the San Francisco Bay Region. Since we are in the beginning of this process it is premature to make impairment findings based on the Marin County data alone, as has been requested.

Bay Protection and Toxic Cleanup Program

Requests to list the toxic hotspot sites from the BPTCP were focused on the pollutants in the sediment matrix that exceeded screening guidelines, which are not formal sediment quality objectives, and therefore legally indefensible as a basis for impairment listings (i.e., they are not a numeric part of the water quality standard). Nonetheless, a concern remains about the elevated pollutants in these areas of the bay. Fortunately, the chemicals often exceeding non-regulatory NOAA screening levels in the sediments of the toxic hotspots are also frequently listed as impairing the segments of the San Francisco Bay Estuary, for instance mercury, PCBs, dioxins, furans, dieldrin, chlordane, and DDT, or on the “watch” list in the case of PAHs. Therefore the possible contribution of these chemicals to the impairment of the Bay by toxic hotspots, Department of Defense, and other industrial sites around the Bay such as PG&E sites, will not be overlooked in the current or upcoming TMDL processes for these listed chemicals.

In the meantime, it appears the most defensible finding of impairment that can be made at the nine toxic hotspots are effects-based, including “sediment toxicity” based on amphipod survival and sea urchin development tests and “benthic community effects,” as documented by the benthic community analyses that showed reduced diversity and increased pollution tolerance in the organisms inhabiting these sites. In order to be

“impaired,” both toxicity and benthic effects need to be documented because sediment toxicity alone, without toxicity identification evaluations that link to chemistry, is inadequate for definitive findings of impairment, due to common false positives attributable to naturally occurring sediment chemicals such as ammonia.

Proposed Changes to the 303(d) List

Proposed Listings

The recommended changes to the 1998 303(d) List are shown in Attachment B. Additions are shown in **bold, highlighted format** and deletions are shown in ~~striketrough format~~.

More information about proposed new listings is shown in Attachment C. This table explains which criteria, data, number of samples, and period of monitoring were used to determine that a water body is impaired due to a specific parameter or pollutant.

The proposed listings include:

Petaluma River Listings

Petaluma River for diazinon, based on new monitoring information in the watershed that yielded toxicity endpoints consistent with other listed urban creeks in the San Francisco Bay Region (Petaluma Tree Planters, 1999).

Petaluma River for copper and nickel, based on RMP and new monitoring from the Bay Area Clean Water Association (BACWA) special TMDL study (Grovehog and Salvia, 2000). Only the tidal portion of the mouth of the Petaluma River is specified in this listing, conducted concurrent with a proposed de-listing of the rest of the estuary for copper and nickel, where shoal and channel monitoring indicate consistent compliance with the California Toxics Rule and the Basin Plan, north of the Dumbarton Bridge, and with a proposed site-specific objective for copper and nickel south of the Dumbarton Bridge.

Urban Creeks Diazinon Refined Listing

For the 1998 303(d) list, the Regional Board and U.S. EPA agreed that toxicity identification evaluation studies in the San Lorenzo Creek watershed (Alameda Co.) and various confirmation studies around the region suggested that all segments of streams in urban areas of the region are impaired by the over-the-counter pesticide diazinon. Since this listing, studies conducted throughout urban areas of the state and nation have consistently supported this finding. Meanwhile, in 2000 the U.S. EPA reached an agreement with chemical manufacturers to phase out diazinon for non-agricultural outdoor uses over the next few years, ending sales and distribution of diazinon by August 2003. Ending sales and distribution does not equate to ending applications of diazinon, and questions remain about the persistence of diazinon toxicity and the degree to which citizens will stockpile the pesticide for private use. Therefore, the Regional Board cannot

reasonably conclude that diazinon-related toxicity in urban portions of creeks will end prior to the next listing cycle, and will not propose de-listing based on the recent federal policy decision. As with this year's proposal on copper and nickel, any proposal to de-list urban creeks for diazinon will be based on ambient monitoring data that demonstrates implementation of the water quality standard.

Arroyo Mocho and Arroyo Las Positas are recommended to be listed for diazinon, based on the oversight in listing in 1998 according to criteria used to define urban creeks (listed in Basin Plan; have existing or potential Aquatic Life Uses; and within the jurisdiction of a member of the Bay Area Stormwater Management Agencies Association). Uses for Arroyo Mocho and Arroyo de las Positas are based on those designated for Arroyo de la Laguna, to which they are both tributary and therefore the beneficial uses apply. These two water bodies were added to the Basin Plan in 1995 without any process of designation of beneficial uses. Field reconnaissance by Regional Board staff in March 2001 indicates that aquatic life beneficial uses exist for Arroyo Mocho and Arroyo Las Positas. Arroyo Hondo will be concurrently de-listed because of its erroneous listing in 1998. It is a rural watershed upstream of Calaveras Reservoir, a drinking water source, not within the jurisdiction of a member of the Bay Area Stormwater Management Agencies Association, with no known or suspected sources of diazinon.

Because the Basin Plan is currently being updated to include more water bodies, especially in the San Mateo Bayside and East Bay drainages, Table 1, below, is not considered comprehensive. Example urban creeks that will be added to the Basin Plan and meet the above criteria for "urban creeks" include but are not limited to Pulgas Creek, Redwood Creek, Cordilleras Creek, Belmont Creek, Laurel Creek, Mill Creek, Sanchez Creek, San Bruno Creek, and Colma Creek in San Mateo County; Rheem Creek, Garrity Creek, Baxter Creek, and Cerrito Creek in Contra Costa County; and Codornices Creek, Strawberry Creek, Temescal Creek, Sausal Creek, Peralta Creek, Arroyo Viejo, Ward Creek, Sulphur Creek, Dry Creek, Crandall Creek, and Laguna Creek in Alameda County. Additionally, Refugio Creek in Northwest Contra Costa County (City of Hercules) was added to the Basin Plan in 1995 without any process of designation of beneficial uses, and it is directly tributary to San Pablo Bay, so the tributary rule for aquatic life uses cannot apply without a process of designating uses, although aquatic life uses are expected to exist based on criteria outlined in the Basin Plan (p. 2-5). Adding these creeks for accuracy and consistency would increase the number of listed creeks by 25, increasing the 36 listed creeks to 61.

TABLE 2

**URBAN CREEKS IMPAIRED BY DIAZINON
SAN FRANCISCO BAY REGION**

Urban Creek	Length (miles)	Aquatic Life Beneficial Uses			
		Cold	Warm	Migr	Spwn
Alameda County					
Alameda Creek	51	E	E	E	E
Arroyo de la Laguna	7	P	P	E	E
Arroyo del Valle	49	E		P	E
Arroyo Mocho*	40	P	P	E	E

		Length (miles)	Aquatic Life Beneficial Uses			
			Cold	Warm	Migr	Spwn
Urban Creek						
Arroyo Las Positas*		10	P	P	E	E
San Leandro Creek		15	E	P	P	P
San Lorenzo Creek		12	E	E	E	E
Contra Costa County						
Mount Diablo Creek		13	E	E	E	E
Pine Creek		13	E	E		E
Pinole Creek		9	E	E	E	E
Rodeo Creek		8		E		E
San Pablo Creek		16		E	E	E
Walnut Creek		9	E	E	E	E
Wildcat Creek		12		E	E	E
Marin County						
Arroyo Corte Madera del Presidio		3	E			E
Corte Madera Creek		4	E	E	P	P
Coyote Creek		3	E	E		
Gallinas Creek		2	E	E		
Miller Creek		9	E	E	E	E
Novato Creek		19	P	P	P	P
San Antonio Creek		18	E	E	P	P
San Rafael Creek		3	E	E		
San Mateo County						
San Mateo Creek		11	P			E
Santa Clara County						
Calabazas Creek		5	E	E		
Coyote Creek		69	E	E	E	E
Guadalupe River		18		E	P	P
Los Gatos Creek		26	E	E	P	P
Matadero Creek		7	E	E	E	E
Permanente Creek		13	E			E
San Felipe Creek		15	P	E		P
San Francisquito Creek		12	E	E	E	E
Saratoga Creek		18	E	E		
Stevens Creek		22	E	E	E	P
Solano County						
Laurel Creek		3	E	E	E	E
Ledgebrook Creek		12	E	E	E	E
Suisun Slough		10		E		E
Sonoma County						
Petaluma River*		25		E	E	
Cold	Cold Freshwater Habitat—Water that supports cold-water ecosystems, including preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife (including invertebrates).					
Warm	Warm Freshwater Habitat—Water that supports warm water ecosystems including preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife (including invertebrates).					
Migr	Fish Migration—Water that supports habitats necessary for migration, acclimatization between fresh water and salt water, and protection of aquatic organisms that are temporary inhabitants of waters within the region.					
Spwn	Fish Spawning—Water that supports high quality aquatic habitats suitable for reproduction and early development of fish.					
E	Existing Beneficial Use					
P	Potential Beneficial Use					

Source: RWQCB 1995.

* Water bodies added to urban creeks list for 2002 303(d) list based on original criteria proposed in 1998. Petaluma River added to list based on data from Abelli-Amen (1999). Arroyo Hondo has been removed from the list because it was erroneously added in 1998 and is located in a rural, protected watershed for drinking water sources. Uses for Arroyo Mocho and Arroyo Las Positas are based on those designated for Arroyo de la Laguna, to which they are both tributary and therefore the beneficial uses apply. These two water bodies were added to the Basin Plan in 1995 without any process of designation of beneficial uses. Field reconnaissance by Regional Board staff in March 2001 indicates that aquatic life beneficial uses exist for Arroyo Mocho and Arroyo Las Positas.

Fishing Advisory Listings

In this listing cycle, the Contra Costa Health Services issued an interim fishing advisory for San Pablo Reservoir/Mercury, as a result of a California Office of Environmental Health Hazard and Assessment (OEHHA) paired study with Black Butte Reservoir in the Central Valley Region. Mercury levels in largemouth bass exceeded the screening level of 0.3 ppm developed from U.S. EPA protocol, based on an assumed consumption rate that has not been confirmed. The advisory was issued as a conservative measure pending more detailed study of pollutant levels and applicable consumption rates. Since the interim advisory was issued in February 2000, the Regional Board has targeted this waterbody and other commonly fished reservoirs in the San Francisco Bay Region for fish tissue monitoring as part of the Toxics Substances Monitoring Program (TSMP) and the Surface Water Ambient Monitoring Program (SWAMP). No new data are available for consideration for the 2002 303(d) list, but it is the Regional Board's intent to use this information to revisit the San Pablo Reservoir listing and evaluate potential listings for other reservoirs in the region. Similarly, Marin County Environmental Health issued a draft interim advisory for Tomales Bay/Mercury based on recent OEHHA data, and the metals listings for Tomales Bay and Walker Creek have been refined to mercury since the only metals mines in the watershed are mercury mines.

High Coliform Count and Beach Closure Listings

Attainment of water contact recreation uses is determined by comparison of bacterial indicators such as coliform with Basin Plan Objectives. Determination of impairment for this category is based on two separate factors; 1) data indicating exceedance of numeric criteria or 2) closure of beaches by a local agency. The first of these, coliform (total and fecal), *E. coli* and enterococcus data, was evaluated based on Basin Plan objectives in Tables 3-1 and 3-2, and Ocean Plan water contact standards (for ocean beaches). The impairment assessment focused on dry season data (May-October) when the majority of water contact recreation occurs and bacterial indicator results are not confounded by natural factors, such as wildlife fecal matter or soil bacteria that may not pose any pathogenic risk to swimmers. Year-round data was considered for ocean beaches, where the public uses waters in all weather conditions. For evaluation of beach closures, as an indication of beneficial use impairment, year-round county beach closure data from 2000 was reviewed (NRDC, 2001), and U.S. EPA guidance used to determine the support status of water contact recreation (Not supporting, i.e., impaired = one bathing closure per year greater than a week's duration or more than one bathing closure per year). In the San Francisco Bay Region, only San Mateo and San Francisco counties conduct beach closure programs. Only San Mateo County conducts the weekly sampling necessary to assess attainment of coliform water quality objectives. Marin County is planning to initiate a program in the near future (Ed Megia, pers. comm., 2001).

The San Mateo County Environmental Health Department conducts comprehensive monitoring of beaches and creeks for total and fecal coliform and *E. coli*. Trained representatives from Surfrider conduct field sampling, and analysis is carried out by the County's certified laboratory (San Mateo County, 1997-2001). The monitoring is considered comprehensive because in many cases, numerous 5-sample medians or geometric means over 30-day periods can be calculated to assess compliance with Basin

Plan and Ocean Plan water quality objectives. Regional Board staff assessed the number of valid 30- or 60-day calculated medians (total coliform) and geometric means (fecal coliform) for every data set in the county, spanning the public beaches and publicly accessible creeks from Pacifica in the north to Pescadero Beach in the south. Percent exceedances were calculated for the maximum, median, and geometric mean objectives, and used to determine impairment due to high coliform count. Some beaches had no exceedances of medians and geometric means during the dry season (e.g., Pescadero Beach, San Gregorio Beach, Sharp Park Beach, Montara Beach, Surfer's Beach, Pacifica State Beach and San Francisco Bay at Coyote Point), but those that exceeded these objectives were listed as impaired, consistent with U.S. EPA guidance (U.S. EPA, 1996). Of these beaches, San Gregorio Beach, Surfer's Beach, and Pacifica State Beach (also known as Linda Mar or San Pedro Beach) exhibited exceedances during wet weather.

For high coliform count, the following water bodies are recommended for listing: Marina Lagoon in the City of San Mateo, San Pedro Creek, San Vicente Creek, Pomponio Creek, San Gregorio Creek, and the Pacific Ocean at Venice Beach, Rockaway Beach, Pillar Point Beach, Fitzgerald Marine Reserve, Baker Beach (near Lobos Creek mouth) in San Francisco, and for wet weather only, San Gregorio Beach and Pacifica State Beach.

For beach closures, the following water bodies are recommended for listing: Pacific Ocean at Fitzgerald Marine Reserve, Pacifica State Beach (also known as Linda Mar or San Pedro Beach), Pillar Point Beach, Sharp Park Beach, Surfer's Beach, and Venice Beach. All beach closures in San Francisco were based on rainfall and combined sewer overflow (CSO) events and not actual monitoring data, and include Pacific Ocean at Fort Funston, Ocean Beach, and China Beach.

Bay Protection and Toxic Cleanup Program

Findings of impairment at four of the nine toxic hotspots of the Bay Protection and Toxic Cleanup Program (BPTCP) are effects-based, including both "sediment toxicity" based on amphipod survival and sea urchin development tests and concurrent "benthic community effects," as documented by the benthic community analyses that showed reduced diversity and increased pollution tolerance in the organisms inhabiting these sites. Other hotspot sites are on the preliminary or "watch" list, discussed below.

Since completion of the BPTCP in 1999, staff of the Groundwater Protection and Waste Containment Division of the Regional Board have been addressing the BPTCP sites using existing regulatory authorities under SLIC and Title 27, and further assessment and remedial plans first developed under the BPTCP are being implemented at varying levels at the nine sites, listed below in Table 3. For TMDL development these sites will receive a low priority because of the Regional Board's current application of other regulatory authorities and the effects-based nature of the listings (i.e., not pollutants whose loads would be allocated in a TMDL).

TABLE 3

**TOXIC HOTSPOTS OF THE SAN FRANCISCO BAY REGION
SITES WITH DOCUMENTED BIOLOGICAL EFFECTS AND ELEVATED SEDIMENT CHEMISTRY**

TOXIC HOTSPOT	WATERBODY	GEOGRAPHIC LOCATION	BPTCP WEIGHT OF EVIDENCE	303(d) LISTING RECOMMENDATION
Stege Marsh	San Francisco Bay, Central	East of Port of Richmond	Elevated Sediment Chemistry, Recurrent Toxicity, and Degraded Benthic Community	List for Sediment Toxicity and Benthic Community Effects
Mission Creek	San Francisco Bay, Lower	Downtown San Francisco	Elevated Sediment Chemistry, Recurrent Toxicity, and Degraded Benthic Community	List for Sediment Toxicity and Benthic Community Effects
Islais Creek	San Francisco Bay, Lower	Port of San Francisco	Elevated Sediment Chemistry, Recurrent Toxicity, and Degraded Benthic Community	List for Sediment Toxicity and Benthic Community Effects
Peyton Slough	Suisun Bay	Martinez	Elevated Sediment Chemistry and Biological Impact Measured by Either Toxicity or Degraded Benthic Community	List for Sediment Toxicity and Benthic Community Effects
Castro Cove	San Pablo Bay	Northwest of Richmond	Elevated Sediment Chemistry and Biological Impact Measured by Either Toxicity or Degraded Benthic Community	Preliminary List – unlinked Sediment Toxicity/Chemistry only, without evidence of benthic impacts.
Pacific Drydock #1 (area in front of stormdrain)	San Francisco Bay, Lower	Oakland Inner Harbor, across from Coast Guard Island	Elevated Sediment Chemistry and Biological Impact Measured by Either Toxicity or Degraded Benthic Community	Preliminary List – unlinked Sediment Toxicity/Chemistry only, without evidence of benthic impacts.
Central Basin, San Francisco	San Francisco Bay, Lower	Port of San Francisco	Elevated Sediment Chemistry and Biological Impact Measured by Either Toxicity or Degraded Benthic Community	Preliminary List – unlinked Sediment Toxicity/Chemistry only, without evidence of benthic impacts.
Oakland Inner Harbor-Fruitvale	San Francisco Bay, Lower	Oakland Inner Harbor at Fruitvale Ave. Bridge	Elevated Sediment Chemistry and Biological Impact Measured by Either Toxicity or Degraded Benthic Community	Preliminary List – unlinked Sediment Toxicity/Chemistry only, without evidence of benthic impacts.
San Leandro Bay	San Francisco Bay, Lower	South of Oakland Inner Harbor & Alameda Island	Elevated Sediment Chemistry and Toxicity (Site 1) or Mixed Results from Biological Indicators (Sites 2-5, 7). Site 6 showed no impacts.	Preliminary List – unlinked Sediment Toxicity/Chemistry only, without evidence of benthic impacts.

Proposed De-Listings

Only two pollutants are proposed to be removed from the 303(d) list for the San Francisco Bay estuary, based on criteria listed above. Waters proposed for de-listing are summarized below and shown in a strikethrough format in Attachment B.

More information about proposed de-listings is shown in Attachment C. This table explains which criteria, data, number of samples, and period of monitoring were used to determine that a water body is not impaired due to a specific parameter or pollutant.

The proposed de-listings include:

Copper and Nickel in San Francisco Bay Segments

Copper and Nickel are proposed to be de-listed from all segments of the San Francisco Estuary north of the Dumbarton Bridge, where shoal and channel monitoring indicate consistent compliance with the Basin Plan and the California Toxics Rule, enacted since the last listing cycle, which implements new dissolved criteria for metals. South of the Dumbarton Bridge, dissolved copper and nickel data are consistently below the proposed site-specific objectives for copper and nickel. Basin Plan amendments for these site-specific objectives are scheduled for action by the Regional Board in Spring 2002.

On the 1998 303(d) list, copper and nickel are not listed for Richardson Bay, and nickel is not listed for Central San Francisco Bay.

This de-listing is conducted concurrent with a proposed listing of Petaluma River for copper and nickel, based on RMP and new monitoring from the Bay Area Clean Water Association (BACWA) special TMDL study (Grovhough and Salvia, 2000). Only the tidal portion of the mouth of the Petaluma River is specified in this listing. Due to the proximity of ambient levels to the water quality objectives, ongoing impairment at the Petaluma River mouth, and pending commitments of dischargers to specific pollution prevention action plans, copper and nickel in San Francisco Bay segments are recommended to be included on the preliminary or “watch” list described below under “threatened impairments to water quality.” Because Richardson Bay was never listed for these pollutants, it is not included on the “watch” list, nor is nickel in Central San Francisco Bay.

TABLE 4
PROPOSED LISTINGS AND DE-LISTINGS
303(d) LIST OF IMPAIRED WATERBODIES²

Waterbody	Pollutant or Stressor	Recommended Action
Petaluma River (tidal portion at mouth)	Copper, Nickel	List
Petaluma River	Diazinon	List
Arroyo Mocho, Arroyo Las Positas	Diazinon	List
Marina Lagoon	High Coliform Count	List
San Gregorio Creek	High Coliform Count	List
Pomponio Creek	High Coliform Count	List
San Pedro Creek	High Coliform Count	List
San Vicente Creek	High Coliform Count	List
Baker Beach	High Coliform Count	List
China Beach	Beach Closures (wet weather/CSO)	List
Ocean Beach	Beach Closures (wet weather/CSO)	List
Fort Funston Beach	Beach Closures (wet weather/CSO)	List
Sharp Park Beach	Beach Closures (wet weather)	List
Rockaway Beach	High Coliform Count	List
Pacifica State Beach (Linda Mar or San Pedro Beach)	High Coliform Count (wet weather), Beach Closures	List
Fitzgerald Marine Reserve	High Coliform Count, Beach Closures	List
Pillar Point Beach	High Coliform Count, Beach Closures	List
Surfer's Beach	High Coliform Count (wet weather), Beach Closures	List
Venice Beach	High Coliform Count, Beach Closures	List
San Gregorio Beach	High Coliform Count (wet weather)	List
San Pablo Reservoir	Mercury	List
Tomales Bay, Walker Creek	Mercury	Change from "Metals"
Stege Marsh	Sediment Toxicity and Benthic Community Effects	List
Mission Creek	Sediment Toxicity and Benthic Community Effects	List
Islais Creek	Sediment Toxicity and Benthic Community Effects	List
Peyton Slough	Sediment Toxicity and Benthic Community Effects	List
Arroyo Hondo	Diazinon	De-List (non-urban)
San Francisco Bay Segments (except Richardson Bay) ³	Copper	De-list, place on Preliminary List
San Francisco Bay Segments (except Richardson Bay and Central San Francisco Bay) ³	Nickel	De-list, place on Preliminary List

² See Attachment C, Rationale for Listing, for specific information on exceedance frequencies related to water quality objectives.

³ San Francisco Bay Segments are generally defined as San Francisco Bay, Central; San Francisco Bay, Lower; San Francisco Bay, South; Richardson Bay; San Pablo Bay; Carquinez Strait; Suisun Bay; and Sacramento-San Joaquin Delta. Copper and nickel are not currently listed for Richardson Bay, and nickel is not currently listed for Central San Francisco Bay.

Threatened Impairments to Water Quality

This year, the Regional Board is proposing a preliminary or “watch” list for waterbodies and pollutants where anecdotal information suggests they may be impaired but either (1) the available data or information are inadequate to draw a conclusion, or (2) a regulatory program is in place to control the pollutant but data are not available to demonstrate that the program is successful. Both scenarios are common, due to limited information, and both should trigger assessment activities to support impairment decisions in the following listing cycle, which is proposed in this section of the report for specific waterbodies and pollutants in the San Francisco Bay Region.

Without an established, formal monitoring and assessment program for the state’s water bodies, the Regional Boards have to make decisions on water quality impairment with a wide range of quality and quantity of information. With a few exceptions such as the Bay’s Regional Monitoring Program, funded by dischargers, ambient monitoring at a level of quality needed for rigorous 303(d) listing considerations is very limited. Indeed, many states struggle to perform adequate monitoring and assessment with the staff and resources they are allocated. In April 2001, the National Research Council (NRC) published a report entitled “Assessing the TMDL Approach to Water Quality Management,” produced at the request of the U.S. Congress, examining the scientific basis of the 303(d) and TMDL process. The NRC report underscored the chronic lack of resources at the state level to perform comprehensive water quality assessments. To improve the TMDL process, which currently presumes that scientifically adequate assessments are routinely funded and conducted, the NRC recommended, ***“EPA should approve the use of both a preliminary list and an action list instead of one 303(d) list.”*** They note that Congress may have to change the law in order to authorize this policy approach, which would better reflect the reality of state water quality assessment capabilities.

Regional Board staff support the concept of two lists – a preliminary list and an impaired water bodies list. TMDLs are developed for the latter list, but a finding of threatened impairment and placement on a preliminary list would result in increased assessment activity, or actions to determine whether or not a water body and pollutant should be added to the impaired list in the subsequent listing cycle. The preliminary list carries with it obligations for more information collection and assessment to resolve the issue of whether there is impairment. The National Research Council (NRC) recommends specific guidelines for creating the preliminary list (NRC, 2001), but one key characteristic is that “no water body should remain on the preliminary list for more than one rotating basin cycle.” The rotating basin cycle presumes a formal, staffed and funded statewide monitoring and assessment program that provides assessment information every five years. Currently, California is initiating the Surface Water Ambient Monitoring Program (SWAMP), but at an annual total budget of \$3.6 million and 10 personnel for the State Board and nine Regional Boards, the program is under-funded and under-staffed by at least one order of magnitude. The Regional Board proposes a preliminary list that utilizes existing regulatory authority to generate new assessment information for the waterbodies and pollutants specified as threatened impairments to

water quality (Table 5). Interested parties can use the preliminary list as a reference to evaluate the Regional Board's recommendations at the next listing cycle. Above all, the preliminary list recommended by the Regional Board will implement recommendations of the NRC.

During the public solicitation, a number of substantive water quality problems were brought to the Regional Board's attention, requiring decisions on whether to add over 100 water body/pollutant combinations to the 303(d) list. In many cases, the data or information is not of adequate quality and quantity to support a listing and subsequent TMDL regulatory process, but in the cases below, a finding is warranted that water quality appears threatened and more information must be collected to resolve the question of impairment. In many other cases, the water body/pollutant is already captured in an existing listing (e.g., excessive ammonia in San Antonio Creek, tributary to Petaluma River that is listed for nutrients, or elevated PCBs in sediment at a toxic hotspot, adjacent to San Francisco Bay listed for PCBs).

The Regional Board exercises the precautionary approach to water quality protection in its listing recommendations, and has found adequate basis to suggest several water bodies and pollutants that are threatened impairments to water quality, to be acted upon in the subsequent listing cycle based on more information and pending the results of existing water quality improvement programs. Additionally, two water body/pollutant combinations from the 1998 303(d) list warrant placement on a preliminary list, concurrent with de-listing recommendations, with the exception of Lake Merritt low dissolved oxygen/organic enrichment, which is recommended to remain on the 303(d) list. Below are discussions of waterbodies and pollutants that are recommended for preliminary list status.

TABLE 5
ASSESSMENT PRIORITY LIST:
PRELIMINARY LIST OF WATERBODIES AND POLLUTANTS

Waterbody	Pollutant(s) or Stressor(s)	Assessment Activity or Entity and Regulatory Authority
San Francisco Bay Segments ⁴	Copper, Nickel	Regional Monitoring Program, Section 13267 ⁵ ; Copper and Nickel Special Study North of the Dumbarton Bridge and Resultant Pollution Prevention Action Plans
San Francisco Bay Segments ⁴	PAHs, PBDEs	Regional Monitoring Program, Section 13267
Lake Merritt	Low Dissolved Oxygen/ Organic Enrichment	Lake Merritt Water Quality Committee, Section 13267
Lake Merced	Low Dissolved Oxygen/ Organic Enrichment, pH	San Francisco Public Utilities Commission, Section 13267
Redwood Creek, tidal portion (San Mateo County)	High Coliform Count	San Mateo County Env. Health Dept. Monitoring, AB 411 Beach Monitoring
Castro Cove, Richmond	Sediment Toxicity	Bay Protection and Toxic Cleanup Program Remedial Plans, SLIC, and Title 27
Central Basin, San Francisco	Sediment Toxicity	Bay Protection and Toxic Cleanup Program Remedial Plans, SLIC, and Title 27
Oakland Inner Harbor (Pacific Drydock Yard 1 and Fruitvale sites)	Sediment Toxicity	Bay Protection and Toxic Cleanup Program Remedial Plans, SLIC, and Title 27

⁴ San Francisco Bay Segments are generally defined as San Francisco Bay, Central; San Francisco Bay, Lower; San Francisco Bay, South; Richardson Bay; San Pablo Bay; Carquinez Strait; Suisun Bay; and Sacramento-San Joaquin Delta. Copper and nickel are not currently listed for Richardson Bay. Nickel is not currently listed for Central San Francisco Bay.

⁵ Section 13267 of the California Water Code provides each Regional Board authority to investigate water quality and to require any person discharging or proposing to discharge waste to furnish technical or monitoring program reports where the burden, including costs, of these reports bears a reasonable relationship to the need for the reports and benefits to be obtained from the reports.

TABLE 5 (cont.)

Waterbody	Pollutant(s) or Stressor(s)	Assessment Activity or Entity and Regulatory Authority
San Leandro Bay	Sediment Toxicity	Bay Protection and Toxic Cleanup Program Remedial Plans, SLIC, and Title 27
Novato Creek below Stafford Dam	Sedimentation/Siltation	Marin County Flood Control District's Novato Creek Watershed Erosion Inventory and Sediment Control Plan, Condition 10 of the June 22, 2000, Section 401 Water Quality Certification for removing accumulated sediment in Novato, Warner, and Arroyo Avichi Creeks.
Pilarcitos Creek below Pilarcitos Reservoir	Sedimentation/Siltation	Pilarcitos Creek Advisory Committee (PCAC), Section 13267
Urban Creeks, Lakes, and Shorelines	Trash	NPDES Stormwater Program Annual Program Reports, Section 13267

Copper and Nickel in San Francisco Bay Segments

New information on copper and nickel in San Francisco Bay segments and new CTR and site-specific criteria, described above, suggest there is adequate basis for de-listing. However, dissolved copper and nickel concentrations measured in the RMP and the TMDL special study exceed the CTR criteria at the station at the mouth of the Petaluma River, and dissolved copper values throughout the estuary are not far below applicable thresholds of concern. The TMDL special study is not complete at the time of the Regional Board's consideration of this report. Moreover, commitments of dischargers to action plans that are necessary to maintain ambient copper and nickel levels below levels of concern are still pending. The Regional Board's recommendation to de-list copper and nickel, except at the mouth of the Petaluma River, is dependent on the actions of dischargers during the next listing cycle. The commitment of dischargers to these actions is tentative at this time, and therefore copper and nickel are considered to threaten water quality of the Bay segments, based on proximity to the regulatory threshold, unfinished investigations in the North Bay, and antidegradation.

Several relevant work products remain unfinished at the time of this report:

- (1) A draft technical report is pending on the results of the special study North of the Dumbarton Bridge. This will include results and interpretation of the ambient monitoring and toxicity testing along with review of relevant RMP data. The draft report will be available at the end of November 2001.
- (2) The Coordinating Committee (the stakeholder group for this project) convenes in December 2001 to consider the draft technical report and how to move forward with peer review by a panel of technical experts.
- (3) The draft report will receive review in early 2002 by a technical review committee (TRC), and the final technical report will be delivered soon after receipt of final TRC comments.
- (4) Work will then begin on a formal impairment assessment and action plan document. From the point when work is started on this document, it is estimated that the final product will be completed in 12-18 months. Regional Board staff expects to see a demonstration of an ongoing commitment by dischargers through the development of pollution prevention actions plans for copper and nickel patterned after similar plans developed in Lower South San Francisco Bay.
- (5) The dischargers may petition for consideration of a site-specific objective for copper once the action plans are developed and they can demonstrate that their petition meets the requirements described in the State Implementation Policy for the CTR. Namely, for dischargers who cannot meet the effluent limits based on the current objectives, they must demonstrate that they already have implemented all reasonable treatment, source control, and pollution prevention measures.

Regional Board staff recommends that targeted monitoring for copper and nickel continue to ensure that beneficial uses are protected, and to document any other sites in the estuary that may be exhibiting exceedances similar to the mouth of the Petaluma River. Based on the consistently high levels documented at the Petaluma River mouth, the RMP and TMDL special study spatial coverage are not adequate to conclude that un-monitored freshwater/saltwater interfaces or actively dredged riverine channels are meeting the water quality standard for copper and nickel.

Much effort has been expended in the last decade identifying and controlling sources of copper and nickel to waters of the state, particularly in Lower South Bay. The collective pollution prevention and treatment efforts have contributed to load reductions of these pollutants that help maintain ambient concentrations below regulatory thresholds, but not very far below these levels. The pollution prevention and industrial pretreatment efforts must continue indefinitely to ensure that copper and nickel levels in the waters of the state do not increase and violate water quality objectives or impair beneficial uses. Over the next listing cycle staff will use existing regulatory authorities to ensure that dischargers maintain control measures for copper and nickel.

PAHs (polynuclear aromatic hydrocarbons) in San Francisco Bay Segments

PAHs are known carcinogens that accumulate in shellfish tissue, but do not accumulate in fish tissue. The weight of evidence from the RMP indicates that although water quality criteria are almost never exceeded at RMP stations (between 0 and 1 % of RMP water sample individual PAH concentrations exceeded the EPA and CTR criterion) there is evidence that PAHs may be accumulating at higher levels over time and other effects thresholds such as toxicity have been noted. (Hoenicke, Hardin, et al., in prep.; Thompson et al., 1999). Individual PAH criteria were only exceeded for HPAHs (high molecular weight PAHs), having at least 4 rings. Individual PAH concentrations are generally between 0 and 15% of CTR Criteria (Table 2, below), with occasional sampling events of certain compounds as high as 347% of criteria.

TABLE 6
CONCENTRATIONS OF PAHs IN RMP WATER SAMPLES
(1993-1998) AND CTR CRITERIA⁶

	<u>Mean %</u>	<u>Median %</u>	<u>Max %</u>
Acenaphthene	0%	0%	0%
Anthracene	0%	0%	0%
Fluorene	0%	0%	0%
Benz(a)anthracene	7.8%	2.4%	205%
Chrysene	6.7%	2.9%	91%
Pyrene	0%	0%	0%
Benzo(a)pyrene	4.8%	0%	110%
Benzo(b)fluoranthene	15%	5.9%	348%

⁶ The percentage indicated is the ratio of the concentration found and the CTR Criterion. Thus, for example, the mean water column concentration of Benz(a)anthracene is 7.83%, or approximately 1/13th, of the CTR Criterion.

	<u>Mean %</u>	<u>Median %</u>	<u>Max %</u>
Benzo(k)fluoranthene	5.5%	2.0%	195%
Dibenz(a,h)anthracene	1.6%	0.7%	33%
Fluoranthene	0%	0%	0.02%
Indeno(1,2,3-cd)pyrene	11%	5.2%	196%

In most RMP water samples, PAHs did not exceed the threshold concentrations for adverse effects in fish embryos (Carls et al. 1999; Heintz et al. 1999). Depending on the effects threshold used, between 0 and 64% of RMP site sediment concentrations exceeded the threshold concentrations for adverse effects on biota (SFEI, 2001). Thompson et al. (1999) observed significant correlation between percent mortality of the amphipod, *Eohaustorius estuarius* and concentration of LPAH (low molecular weight PAHs) and HPAH in the Castro Cove, Alameda, and San Bruno Shoal sites of the RMP. PAH sediment concentrations were above ERL and ERM in these sites.

Spies and Rice (1988) linked egg and embryo mortality of starry flounder to activity of the P4501A enzyme, which is PAH inducible. PAHs in transplanted bivalves increased over time in certain regions in the estuary (Hoenicke, Hardin, et al., in prep.), including increases in the total PAHs in the inner estuary during the dry season. Combustion product PAHs increased in the inner estuary, central, and south regions in the dry season. Some decreases in specific regions/seasons were also observed. (e.g. total PAHs in the central region during the wet season). This paper also indicated a significant positive correlation between number of bridge trips (an index of automobile use) and both total PAHs and combustion product PAHs. Pereira et al. (1999) indicated higher concentrations of PAHs since the 1950s than during the late 1800s, presumably resulting from increases in industrialization and urbanization. Eljarrat et al. (2001) recently evaluated the toxic potency of PAHs alongside PCBs and dioxins in Mediterranean Spain and found that the PAH toxic equivalent values were several times higher than that of PCBs or dioxins, in accordance with other recent studies reporting a large contribution of PAHs to dioxin-like activity in sediments (Khim et al., 1999; Kannan et al., 2000; Anderson et al., 1999).

Over the next listing cycle, the Regional Board expects greater attention from dischargers to sources and control measures for PAHs. PAH water quality objectives from the California Toxics Rule (CTR) are human health-based and are therefore incomplete with respect to potential impacts to aquatic life described above. PAHs are elevated in sediments of about half the toxic hotspot sites identified in the Bay Protection Program, exhibiting a correlative (not causative) but potentially synergistic effect on aquatic life along with other chemicals, as evidenced by sediment toxicity tests and degraded benthic communities (BPTCP, 1998). Occasional exceedances of the human health criteria in ambient samples, evidence of increasing shellfish concentrations, and preponderance of PAHs at toxic sites warrant increased assessment activities for PAHs by dischargers and cities around the region. RMP resources will be expected to better assess PAH impacts in the estuary, since the current spatial and temporal coverage does not address areas near the shoreline that may be greater impacted by PAHs in discharges of urban runoff and other sources.

PBDEs (polybrominated diphenyl ethers) in San Francisco Bay Segments

Little or no data are available in the San Francisco Bay Region for many known or suspected contaminants. The RMP is currently reviewing analytical laboratory information (e.g., gas chromatographs) to identify unknown contaminants. Some of the unknown peaks in the gas chromatographs were recently identified by the RMP as polybrominated diphenyl ethers, or PBDEs, a common flame retardant found in furniture and other materials. Concurrently, a paper by She, et al. (2001), in press, documents that levels of PBDEs in San Francisco Bay harbor seal blubber are among the highest reported elsewhere, a dramatic increase in PBDEs in harbor seals was observed over the last ten years, and PBDE levels in human breast adipose tissue from the San Francisco Bay Area are the highest reported to date. Most of the studies on PBDE levels have occurred in northern Europe and Canada. Very few data are available on levels of PBDEs in the United States (She et al., 2001). PBDEs are hydrophobic, persistent compounds expected to bioaccumulate in the food chain, their effects are largely unknown, and they are chemically similar to known carcinogens such as PCBs and dioxins. The weight of evidence of increasing concentrations and their unregulated status warrant a finding that PBDEs threaten to impair water quality in all segments of the San Francisco Bay Estuary, all influenced by wastewater and urban runoff discharges, the likely sources of PBDEs. A formal listing is precluded at this time due to lack of an enforceable water quality criterion or objective. Nevertheless, the available information on PBDEs must trigger immediate attention and action to avoid irreversible impacts to aquatic life and human health that can be reasonably anticipated based on their physical and chemical properties, and documented increases in the food chain, despite the lack of clear regulatory guidance on these pollutants at this time.

Actions of dischargers will be reviewed in the next 303(d) listing process regarding discharge characterization, source identification, and pollution prevention of PBDEs. Research literature will be reviewed to ascertain any new information on actual effects thresholds for these persistent bioaccumulative substances. These actions can be conducted regionally through the RMP, the Bay Area Pollution Prevention Group, or other association of dischargers. During the subsequent listing cycle, Regional Board staff evaluation of current research, applicable water quality criteria, and local actions to characterize sources and pollution prevention of PBDEs will determine whether an impairment listing is accepted or rejected.

Dissolved Oxygen and Organic Enrichment in Lake Merritt

In 1998, the U.S. EPA listed Lake Merritt as impaired by low dissolved oxygen (DO) and organic enrichment. The original data used by U.S. EPA to recommend listing does not meet quality and quantity requirements necessary to support 303(d) listing, specified in U.S. EPA guidance. No assessment methodology for organic enrichment was followed, and the organic matter discharged to the lake would probably be better characterized as a source of potential DO impairment. Statewide the 303(d) list couples low DO with organic enrichment. Information submitted to the Regional Board during the public solicitation provided anecdotal-level information that DO levels may be inadequate to support beneficial uses, especially when the tide gates are closed by the Alameda County

Flood Control District (ACFCD), but the study design did not document surface DO levels, particularly pre-dawn levels, which provide the necessary estimator of DO to support beneficial uses. No evidence of beneficial use impairment, such as number and frequency of fish kills, has been submitted. A quick review of 1997-98 surface DO data from the county indicates that the Basin Plan standard is met, but specific time-of-day information for this data is not available, and therefore this review is inconclusive.

Dissolved oxygen in Lake Merritt needs to be monitored at the surface and at depth to assess whether there is adequate DO to support beneficial uses. Surface values should be measured early in the morning (pre-dawn if possible) to document worst-case conditions. Because of community concern and anecdotal evidence of continued impairment, Regional Board staff does not recommend de-listing at this time, but recommends that DO be monitored systematically by a public agency such as the ACFCD, City of Oakland, Alameda County Public Works Agency, or other stakeholder. This monitoring should be conducted at a minimum at the same sites as studies submitted by the Lake Merritt Institute, but more frequently than before, continuously where resources allow, to assess whether the lake is truly impaired due to lack of DO. This water body/pollutant combination is different than all others because it is on the “watch” list to confirm an earlier listing decision by U.S. EPA that may or may not be supported by current water quality information.

Dissolved Oxygen and pH in Lake Merced

The San Francisco Water Department conducts quarterly monitoring of the different portions of Lake Merced (North Lake, East Lake, South Lake – two locations) for basic water quality parameters such as dissolved oxygen (surface and 15 feet depth) and pH. Data were submitted from the period of September 1997 through December 2000, totaling 14 samples at each location (four sites total). The grab samples were typically taken in the late morning (Dave Dingman, pers. comm., 2001). The Basin Plan Objective for DO in cold freshwater habitat ($>7\text{mg/l}$), designated at Lake Merced, was violated in 36% of surface samples in East Lake, and the Basin Plan Objective for pH (>8.5) was violated in 36% of samples at North Lake. Because DO and pH are such dynamic parameters, the spatial and temporal coverage of this study is not adequate to assess impairment. Surface dissolved oxygen and pH should be measured continuously or with multiple grabs where possible, and DO measured pre-dawn or early morning, and pH in the late afternoon to ascertain the more worst-case conditions. Regional Board staff recommends that DO and pH be monitored systematically by a public agency such as the SFWD, the San Francisco Public Utilities Commission, or other stakeholder. This monitoring should be conducted at the same sites as the SFWD program plus additional sites within the different portions of the lake, and more frequently than before, continuously where resources allow, to assess whether the lake is truly impaired due to lack of DO or elevated pH. In the next listing cycle the Regional Board will re-evaluate DO and pH information, including the 1997-2000 data, and either accept or reject an impairment determination for DO and pH.

High Coliform Count in Redwood Creek (San Mateo County – tidal portion)

San Mateo County recently began monitoring of *E. coli* in the tidal portion of Redwood Creek in Redwood City. This area contains live-aboard houseboats. Twelve samples were taken in 2001 that suggest water quality impairment compared to Basin Plan objectives (4 out of 12 samples), but the temporal coverage of this study is considered inadequate for a regulatory listing and finding of impairment. Therefore, Regional Board staff recommends that bacterial levels threaten to impair water quality in this water body, and will evaluate San Mateo County data in the next listing cycle to determine if it should be added to the 303(d) list.

Bay Protection and Toxic Cleanup Program

The BPTCP documented elevated chemicals in sediments, along with sediment toxicity and benthic community impacts at four areas in the Region, recommended for listing above. Another set of five toxic hotspots defined by elevated sediment chemistry and sediment toxicity is recommended for inclusion on the preliminary list. Regional Board staff propose that these waterbodies be included on the “watch” list because (1) the presence of elevated chemicals alone can not lead to a listing (no sediment quality objectives), and (2) the presence of sediment toxicity without corroborating evidence of *in-situ* benthic community effects is not conclusive of impairment, because of natural confounding factors (e.g., ammonia toxicity), and a causal link to elevated chemistry was not established in the BPTCP (e.g., via a toxicity identification evaluation or TIE). Nevertheless, the five sites on the “watch” list are toxic hotspots with remedial plans that are required to be implemented under the BPTCP and the Regional Board can use existing authorities to require cleanups under SLIC and Title 27, as it is doing already for some sites. The sites recommended for listing are based on the summary Table 28 in the final technical report (BPTCP, 1998), and waterbodies include (1) Castro Cove (Richmond), (2) Central Basin (San Francisco), (3) San Leandro Bay (based on 6 of 7 sites), and (4) Oakland Inner Harbor (two sites: Pacific Drydock Yard 1, area in front of stormdrain, and Oakland-Fruitvale).

Sedimentation/Siltation in Novato Creek

Dramatic changes due to erosion and sedimentation have been documented in the Novato Creek watershed, and warrant consideration of a 303(d) listing (Collins, 1998). The aquatic life beneficial uses are designated only as *potential* beneficial uses in the Basin Plan, but Novato Creek has been identified as supporting steelhead, a threatened species, in regional native fish surveys (Leidy, 1997). Although erosion and sedimentation are significant in Novato Creek downstream of the Stafford Dam, an explicit linkage to beneficial use impacts, particularly steelhead (RARE, COLD, SPWN, MIGR), has not been made to date, although aesthetic (REC-2) impacts are apparent based on geomorphic studies (Collins, 1998). The Marin County Department of Public Works (MCDPW) has studied sources of sediment to Novato Creek, and has a draft erosion inventory and sediment control plan out for comment (Prunuske Chatham, 2001). The two sediment reports have resulted from conditions of 401 certifications granted by the Regional Board for dredging permits in lower Novato Creek. Because there is a sediment management planning process underway required by regulatory action, Regional Board staff believes that the water quality standard may be implemented within the next listing

cycle. Also, the sediment control plan recommends identifying areas of potential and existing salmonid spawning habitat and will better link the effects of sediment input from in-stream (the major source) and hillslope sources on beneficial uses. The Regional Board recommends that sediment threatens to impair water quality in Novato Creek. In the next listing cycle, the Regional Board will evaluate the planned sediment management and salmonid habitat identification efforts and an impairment listing either accepted or rejected. If the sediment control plan is not implemented, then the impairment listing may be triggered.

Sedimentation/Siltation in Pilarcitos Creek

Field surveys conducted in development of the Pilarcitos Creek Watershed Restoration Plan (Philip Williams & Associates, 1996) document widespread deposition of a large amount of fine sediment in and on the streambed, clogging spawning sites and filling pools. Widespread occurrence of a large amount of fine sediment in and on the streambed reduces spawning success and juvenile rearing (Philip Williams & Associates, 1996). Increased sediment production to channels may also result in longer periods of elevated turbidity following storms. Such a change in sediment transport duration and/or rate, may make it much more difficult for salmon, steelhead trout (and other stream species that are sight feeders) to successfully capture prey. This type of problem has been identified as a potentially important limiting factor in several streams in northwestern California (L. Reid, 1998; B. Trush and F. Ligon, personal communications, 2000 and 2001). Turbidity monitoring has not been conducted in Pilarcitos Creek so it is not possible, at this time, to determine whether such a problem exists in Pilarcitos Creek. Pilarcitos Creek should be listed as threatened by increased sediment production because: 1) there is a clear linkage between sediment and degradation of habitat for steelhead in this watershed; 2) it remains to be determined whether human activities are an important factor; and 3) there is an active watershed restoration program, the Pilarcitos Creek Watershed Advisory Committee (PCWAC), that has broad stakeholder participation and support. The sources of fine sediment are not adequately characterized to support a 303(d) listing at this time.

A rapid sediment budget study is needed for Pilarcitos Creek watershed to determine: a) the significant active processes that are delivering sediment from upslope areas to channels; b) which processes are natural and which processes are caused by or accelerated by human management activities; c) what are the rates and grain-size distributions of sediment delivered from each significant active process. Such information combined with hydraulic, geomorphic, and ecological assessment of channels would lead to an understanding of what percentage of the fine sediment deposition is the result of human activities and what improvement might be possible through management actions to reduce the amount of sediment production to channels. This is the type of information needed to develop to address sediment-related impacts to steelhead trout and other native fish species in the Pilarcitos Creek watershed.

The PCWAC has obtained some funding from U.S. EPA to perform reconnaissance assessment of sediment. As such, Regional Board staff believes that the best available technology to control sediment has not been implemented, and there is a management

process underway. The progress of this effort will be reviewed at the next listing cycle and if there is not progress on developing a rapid sediment budget study described above, an impairment listing may be triggered.

Trash in Urban Creeks, Lakes and Shorelines

As discussed above, anecdotal information exists that suggests impairment of water quality by trash in urban creeks, lakes, and shorelines around the Region, and chronic violations of the Basin Plan Prohibition. Some local jurisdictions expend substantial resources and effort to control litter and trash entering waterbodies, while others may not recognize trash as a water quality issue. The disparity of effort regionwide raises issues of equity in making blanket findings about impairment of water quality due to trash. One fundamental question of trash impairment assessment needs to be answered before the Regional Board makes impairment findings: if a discharger (municipality) regularly removes large masses of trash from a waterbody, is it impaired due to the recurrence of trash, or is it not impaired because it is regularly cleaned and trash is prevented from reaching receiving waters such as San Francisco Bay or Lake Merritt? Is a waterbody not impaired by trash because it is relatively clean compared to waterbodies that receive less organized cleanup efforts? Based on comments received from interested parties, there is a polarized range of opinions on this question of assessment methodology. The various options for trash impairment assessment should jump-start discussions in an upcoming period of increased assessment and control measures for trash in urban waterbodies, tied to the Regional Board's existing regulatory authority in reviewing annual reports from municipal stormwater agencies for trash assessment and control measures.

Between now and the next 303(d) listing cycle, municipalities will be expected to assess trash impairments in their jurisdiction, as documented in annual reports to the Regional Board. The approach should mirror the standard TMDL approach of defining the problem, identifying the sources (trash hot spots) through monitoring or existing information, and developing a program of action to address the principle sources, which will likely be associated with schools, convenience stores and restaurants, and places where citizens chronically dump excess garbage in violation of existing litter laws. Regional Board staff will review this specific information in the next listing cycle and determine whether specific water bodies warrant 303(d) listing, and note the existence of relatively clean urban streams.

The prevention and removal of trash in the urban streams, lakes, and coastlines of the San Francisco Bay Region will implement the mission of the Regional Board, to protect beneficial uses of waters, on many levels. Addressing trash as a pollutant ultimately will lead to improved water quality and protection of aquatic life and habitat, expansion of opportunities for public enjoyment of the state's waters, enhancement of public interest in urban waterways, public participation in restoration activities, and propagation of the vision of urban streams as a viable ecosystem and enhancement of the quality of life of nearby residents. The current trashed condition of many urban waterways perpetuates a widespread public perception that such waters are a dumping ground and hold little ecological value. This mis-perception undermines the Regional Board's goals of

improving water quality in urban portions of the San Francisco Bay Region, since so much of potential improvement depends on the actions of individuals and their management of pollutants in the diffuse watershed setting. As such, the Regional Board intends to elevate the management of trash in watersheds as part of this 303(d) list review process, and finds that trash threatens to impair water quality in all urban creeks, lakes, and shorelines in the San Francisco Bay Region.

Urban creeks were defined during the 303(d) process in 1998, refined for this process, and include 36 creeks, all listed as impaired by diazinon. Because the Basin Plan is currently being updated to include more water bodies, especially in the San Mateo Bayside and East Bay drainages, Table 7, below, is not considered comprehensive. Example urban creeks that will be added to the Basin Plan and meet the above criteria for “urban creeks” include but are not limited to those listed on pages 20-21, above. In addition to aquatic life uses, trash affects water recreation uses (REC1 and REC2) and wildlife habitat use (WILD), and designations for WILD are indicated in Table 7, below. Urban lakes are defined using the same criteria of having designated aquatic life or wildlife uses and located within the jurisdiction of a Phase I stormwater management program. Urban shorelines will be defined in consultation with stakeholders based on various assessment activities, prior to the next listing cycle.

TABLE 7
URBAN CREEKS AND LAKES⁸
PRELIMINARY LIST FOR TRASH IMPAIRMENT ASSESSMENT
SAN FRANCISCO BAY REGION

Water Body	Length (miles)	Wild	Aquatic Life Beneficial Uses			
	or Area (acres)		Cold	Warm	Migr	Spwn
Alameda County						
Alameda Creek	51	E	E	E	E	E
Arroyo de la Laguna	7	E	P	P	E	E
Arroyo del Valle	49	E	E		P	E
Arroyo Mocho*	29	E	P	P	E	E
Arroyo de las Positas*	14	E	P	P	E	E
San Leandro Creek	15	E	E	P	P	P
San Lorenzo Creek	12	E	E	E	E	E
Alameda Creek Quarry Ponds	200		E	E		
Lake Merritt**	160	E				E
Lake Temescal	8	E	E			E
Lake Elizabeth	51	E	E	E		E
Contra Costa County						
Mount Diablo Creek	13	E	E	E	E	E
Pine Creek	13	E	E	E		E
Pinole Creek	9	E	E	E	E	E
Rodeo Creek	8	E		E		E
San Pablo Creek	16	E		E	E	E
Walnut Creek	9	E	E	E	E	E

⁸ Lakes in this table are considered a preliminary list, based on review of water bodies in the Basin Plan.

Water Body	Length (miles) or Area (acres)	Wild	Aquatic Life Beneficial Uses			
			Cold	Warm	Migr	Spwn
Wildcat Creek	12	E		E	E	E
Marin County						
Arroyo Corte Madera del Presidio	3	E	E			E
Corte Madera Creek	4	E	E	E	P	P
Coyote Creek	3	E	E	E		
Gallinas Creek	2	E	E	E		
Miller Creek	9	E	E	E	E	E
Novato Creek	19	E	P	P	P	P
San Antonio Creek	18	E	E	E	P	P
San Rafael Creek	3	E	E	E		
San Francisco County						
Golden Gate Park Lakes	18	E		E		
Lake Merced	250	E	E	E		E
San Mateo County						
San Mateo Creek	11	E	P			E
Santa Clara County						
Calabazas Creek	5	E	E	E		
Coyote Creek	69	E	E	E	E	E
Guadalupe River	18	E		E	P	P
Los Gatos Creek	26	E	E	E	P	P
Matadero Creek	7	E	E	E	E	E
Permanente Creek	13	E	E			E
San Felipe Creek	15	E	P	E		P
San Francisquito Creek	12	E	E	E	E	E
Saratoga Creek	18	E	E	E		
Stevens Creek	22	E	E	E	E	P
Vasona Lake	40	E	E	E		E
Solano County						
Laurel Creek	3	E	E	E	E	E
Ledgewood Creek	12	E	E	E	E	E
Suisun Slough	10	E		E		E
Lake Chabot (Solano)	40	E	E	E		E
Wild	Wildlife Habitat—Water that supports wildlife habitats including preservation and enhancement of vegetation and prey species used by wildlife, such as waterfowl.					
Cold	Cold Freshwater Habitat—Water that supports cold-water ecosystems, including preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife (including invertebrates).					
Warm	Warm Freshwater Habitat—Water that supports warm water ecosystems including preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife (including invertebrates).					
Migr	Fish Migration—Water that supports habitats necessary for migration, acclimatization between fresh water and salt water, and protection of aquatic organisms that are temporary inhabitants of waters within the region.					
Spwn	Fish Spawning—Water that supports high quality aquatic habitats suitable for reproduction and early development of fish.					
E	Existing Beneficial Use					
P	Potential Beneficial Use					

Source: RWQCB 1995.

* Water bodies added to urban creeks list for 2002 303(d) list based on original criteria proposed in 1998. Petaluma River added to list based on data from Abelli-Amen (1999). Uses for Arroyo Mocho and Arroyo de las Positas are based on those designated for Arroyo de la Laguna, to which they are both tributary and therefore the beneficial uses apply. These two water bodies were added to the Basin Plan in 1995 without any process of designation of beneficial uses. Field reconnaissance by Regional Board staff in March 2001 indicate that aquatic life beneficial uses exist for these two streams.

** Lake Merritt is already listed as impaired by floatables – Regional Board recommends change to “trash” for statewide consistency.

Conclusion

Recognizing that a preliminary list has not been formally authorized by the State Board or U.S. EPA, Regional Board staff recommend that this “watch” list be used by interested parties in the next listing cycle to remind the Regional Board of its commitments to help generate and conduct assessments in the next two or four years, using existing regulatory authorities or activities listed in Table 5. The information used this year to generate the “watch” list is not rigorous enough, spatially, temporally, or using the correct indicators, for Regional Board staff to defend impairment listings at this time and more information is needed. We hope that this innovative approach, based on recommendations from the National Research Council in April 2001, will set a positive example of accountability, technical defensibility, and a focus on environmental protection that will result in prevention and abatement of water pollution throughout the San Francisco Bay Region. Rather than a way of deferring action with no assurance of follow-up, this approach is conceived by the Regional Board staff as a tool for continuous planning, and a method of communicating urgent assessment (and cleanup) activities to the regulated community, the environmental community, and other interested parties and organizations, based on their collective input to the Board over the last eight months.

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APPENDIX A

**WATER QUALITY INFORMATION RECEIVED AND
DATA QUALITY EVALUATION SUMMARY**

(consisting of Tables A-1 and A-2)

ATTACHMENT A

**PUBLIC SOLICITATION OF WATER QUALITY INFORMATION
MARCH 2001**



California Regional Water Quality Control Board

San Francisco Bay Region

Winston H. Hickox
Secretary for
Environmental
Protection

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Gray Davis
Governor

PUBLIC SOLICITATION OF WATER QUALITY INFORMATION

The San Francisco Bay Regional Water Quality Control Board (Regional Board) is soliciting the public on behalf of the State Water Resources Control Board (SWRCB) for data and information regarding water quality conditions in surface waters in this Region. The information gathered will be used in various assessments of the State's waters including the development of a submission to US EPA required by the federal Clean Water Act (Section 303(d)). This submission will be developed by the SWRCB and will provide US EPA with a revised list of waters considered by the State to be impaired (not attaining water quality standards) after certain required technology based water quality controls are in place. It is anticipated that this submission will be provided to US EPA by April 2002, as required by federal regulations. The submission will be based on information and data available to the SWRCB and the Regional Water Quality Control Boards. The data and information gathered in this solicitation will also contribute to the preparation of the 2002 federal Clean Water Act Section 305(b) Report on Water Quality.

Anyone, including but not limited to, private citizens, public agencies, state and federal governmental agencies, non-profit organizations, and businesses, possessing information regarding the quality of the Region's waters may provide information.

We are seeking to obtain all readily available data and assessment information generated since July 1997. The Regional Board must receive all data and information you wish to provide by 5:00 p.m. on May 15, 2001. For purposes of this solicitation, information is any documentation describing the current or anticipated water quality condition of a surface water body. We consider data to be a subset of information that consists of reports of measurements of specific environmental characteristics. The data and information may pertain to physical, chemical, and/or biological conditions of the region's waters or watersheds.

Information provided should conform to the following considerations:

- The name of the entity or person providing the information.
- Mailing address, phone numbers, and email addresses for a contact person that can answer questions about any of the information provided.
- Two hard copies and an electronic copy of all information provided. For reports Microsoft Word is the preferred software. Please specify the software used to format the information and provide definitions for any codes or abbreviations used.
- Bibliographic citations for all information provided.
- If computer model outputs are included in the information, please provide bibliographic citations and specify any calibration and quality assurance information available.

Any data provided should conform to the following considerations:

- Data in electronic form, in a spreadsheet, database or ASCII format. Please specify the format and define any codes or abbreviations used in your database.
- A description of, and reference for your quality assurance procedures.
- Metadata for the field data, i.e., when measurements were taken, locations, number of samples, detection limits, etc.

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Date: March 2, 2001

- If possible, **two** hard copies of the data, so that we can verify that we have accurately transferred the data to our database.
- In addition, for data from citizen volunteer water quality monitoring efforts:
 - The name of your group;
 - Indication of any training in water quality assessment completed by members of your group;

We would like to receive data and information as soon as possible and no later than **May 15, 2001**. Data and information submitted after May 15, 2001 may be considered if that data or information was not available prior to May 15, 2001, but the Regional Board was notified on or before May 15, 2001 that it would be available in time for the Regional Board to review and incorporate it into its resolution transmitting its recommendations to the State Board.

Please send any information and data you wish to provide to:

Regional Water Quality Control Board
Atten.: Steve Moore
1515 Clay St., #1400
Oakland, CA 94612

Or by e-mail
303dlist@rb2.swrcb.ca.gov

If you have questions regarding information or data you wish to submit, please contact Steve Moore at (510) 622-2439, or email mmm@rb2.swrcb.ca.gov.

The Regional Boards have been requested to provide recommendations to the SWRCB in Fall 2001 on the condition of Regional waters. The SWRCB will consider all Regional Boards' recommendations regarding the conditions of the Region's waters when formulating the 303(d) submission. The State's submission revising the list of impaired waters will be considered by the SWRCB in a public process to be conducted next winter. Opportunities for review of the proposed submission and public comment on the submission will be announced at a later date.

After May 15, 2001, Regional Board staff will draft proposed changes to the 303(d) list along with the rationale used for proposed changes and distribute them for comment during Summer 2001. Proposed changes will be based on data and information generated between July 1997 and May 2001 (or afterwards in certain cases), established criteria such as beneficial uses and water quality objectives in the San Francisco Bay Water Quality Control Plan (Basin Plan), and applicable guidance published by USEPA. After receiving comments on the proposed changes, the Regional Board staff will prepare a tentative resolution and accompanying staff report for the Regional Board's consideration in Fall 2001. The tentative resolution will transmit the Regional Board's recommendations to the SWRCB on the condition of Regional waters. The staff report will include recommended changes to the 303(d) list, a description of the rationale used for any recommended changes, and a summary of responses to comments received on the proposed changes.

ATTACHMENT B
REVISED 303(d) LIST

ATTACHMENT C

303(d) LISTING RATIONALE

ATTACHMENT C - LISTING RATIONALE FOR 2001 303(d) LIST

Water Body	Hydrologic Basin	Pollutant	Recommended Action	303(d) Listing or De-Listing Rationale	Total Samples	Monitoring Dates	Data Source(s)
San Francisco Bay Segments North of the Dumbarton Bridge	Suisun Basin, San Pablo Basin, Central Basin, South Bay Basin	Copper	De-List	De-list all SF Bay segments North of Dumbarton Bridge except for segment including mouth of Petaluma River. Since March 1993, there have been only 21 exceedances of the current objective, 15 of which were at the Petaluma River station. There has not been an exceedance at any other location since 1997 and the one before that was 1995.	466	3/93 – 4/01	RMP and Special TMDL study
San Francisco Bay Segments North of the Dumbarton Bridge	Suisun Basin, San Pablo Basin, Central Basin, South Bay Basin	Nickel	De-List	<p>Using CTR 8.2 ug/L dissolved as standard: De-list all SF Bay segments North of Dumbarton Bridge except for segment including mouth of Petaluma River. Since March 1993, there have only been 4 exceedances of the CTR objective of 8.2 ug/L dissolved. All of these were at the Petaluma River Station. The most recent exceedance occurred in February 2001 and was twice the Basin Plan objective.</p> <p>Using 1986 Basin Plan 7.1 ug/L total as standard: <u>List</u> all SF Bay segments North of Dumbarton Bridge except for segment including mouth of Petaluma River. Since March 1993, there have been 102 exceedances of the current Basin Plan objective of 7.1 ug/L total nickel. Of these exceedances, there have been 9 at Davis Point, 13 at Grizzly Bay, 9 at Honker Bay, 13 at Napa River, 19 at Petaluma River, 10 at San Pablo Bay. 36 exceedances in 1998-99 alone.</p>	467	3/93 – 4/01	RMP and Special TMDL study

Water Body	Hydrologic Basin	Pollutant	Recommended Action	303(d) Listing or De-Listing Rationale	Total Samples	Monitoring Dates	Data Source(s)
South San Francisco Bay (south of the Dumbarton Bridge)	Santa Clara Basin	Copper	De-List	Using proposed site-specific objective of 6.9 ug/l dissolved, De-list South San Francisco Bay south of the Dumbarton Bridge. 0 out of 690 samples exceed this proposed SSO. If CTR value of 3.1 ug/l dissolved is used, then 35% of samples exceed and the listing would be retained.	690	2/97 – 12/00	San Jose Copper and Nickel Study
South San Francisco Bay (south of the Dumbarton Bridge)	Santa Clara Basin	Nickel	De-List	Using proposed site-specific objective of 12 ug/l dissolved, De-list South San Francisco Bay south of the Dumbarton Bridge. 0.17% of samples (1 of 604) exceed this objective (once in three years, in compliance with standard). If CTR value of 8.2 ug/l dissolved is used, then 1% of samples (6 out of 604) exceed and the listing would be retained.	604	2/97 – 12/00	San Jose Copper and Nickel Study
Petaluma River	San Pablo Basin	Diazinon	List	California Dept. of Fish and Game Acute Criterion of 80 ng/l violated in 33% of samples, corresponding to effects levels in other Bay Area studies.	36	7/98-11/98	Abelli-Amen, Petaluma Tree Planters, 1999
San Pablo Reservoir	San Pablo Basin	Mercury	List	Five out of 12 composite samples exceeded the U.S. EPA screening criteria for mercury in fish tissue (0.3 ppm), all in largemouth bass (trophic level 4), ranging from 0.37 to 0.77 ppm. Contra Costa Health Services issued an interim fish advisory in Feb. 2000.	12 composites (2 trout, 2 catfish, 2 carp, 5 largemouth bass, and 1 crappie)	11/97	California Office of Health Hazard Assessment, Contra Costa Co. Health Services
Stege Marsh	Central Basin	Sediment Toxicity and Benthic Community Effects	List	Elevated sediment chemistry (ERM quotient), 0-1% amphipod survival in all 5 samples, significant urchin toxicity in 3 of 3 samples, relative benthic index of 0.00 in both samples taken. Station with recurrent toxicity and degraded benthic community.	5 amphipod tox., 3 urchin tox., 2 benthic samples, 3 sed. chem..	10/97-12/97	Bay Protection and Toxic Cleanup Program (127 sites total)

Water Body	Hydrologic Basin	Pollutant	Recommended Action	303(d) Listing or De-Listing Rationale	Total Samples	Monitoring Dates	Data Source(s)
Mission Creek	South Bay Basin	Sediment Toxicity and Benthic Community Effects	List	Elevated sediment chemistry (ERM quotient), significant amphipod toxicity in 3 of 5 samples, significant urchin toxicity in 3 of 5 samples, relative benthic index of 0.00, 0.34, and 0.65 in gradient samples taken toward Bay. Station with recurrent toxicity and degraded benthic community.	5 amphipod tox., 5 urchin tox., 3 benthic samples, 5 sed. chem..	5/95-4/97	Bay Protection and Toxic Cleanup Program (127 sites total)
Islais Creek	South Bay Basin	Sediment Toxicity and Benthic Community Effects	List	Elevated sediment chemistry (ERM quotient), significant amphipod toxicity in 3 of 4 samples, significant urchin toxicity in 4 of 5 samples, relative benthic index of 0.22, 0.25, and 0.43 in gradient samples taken toward Bay. Station with recurrent toxicity and degraded benthic community.	4 amphipod tox., 5 urchin tox., 3 benthic samples, 3 sed. chem..	9/94-4/97	Bay Protection and Toxic Cleanup Program (127 sites total)
Peyton Slough	Suisun Basin	Sediment Toxicity and Benthic Community Effects	List	Elevated sediment chemistry (ERM quotient), significant amphipod toxicity in 4 of 5 samples, significant urchin toxicity in 4 of 5 samples, relative benthic index of 0.36, 0.51, and 0.34 in gradient samples taken toward Bay. Station with biological impact by toxicity and somewhat degraded benthic community.	5 amphipod tox., 5 urchin tox., 3 benthic samples, 5 sed. chem..	5/95-4/97	Bay Protection and Toxic Cleanup Program (127 sites total)
Marina Lagoon (4 sampling sites-at mouth, rec. ctr, apt. bldg, aquatic park)	South Bay Basin	Total and fecal coliform	List	Basin Plan Objectives violated in 1% of samples for total coliform max.(>10,000), 50% of samples for total coliform median (>240), 10% for fecal coliform geomean (>200), and 33% of samples for fecal coliform 90 th % ile (>400) in dry weather months.	192 samples for total coliform max., 144 samples for total coliform median, 84 samples for fecal coliform geomean, and 84 samples for fecal coliform 90 th %ile.	10/7/98-10/31/00	San Mateo County Environmental Health Dept. Beach Monitoring

Water Body	Hydrologic Basin	Pollutant	Recommended Action	303(d) Listing or De-Listing Rationale	Total Samples	Monitoring Dates	Data Source(s)
Marina Lagoon (4 sampling sites-at mouth, rec. ctr, apt. bldg, aquatic park)	South Bay Basin	E. coli	List	Basin Plan Objectives violated in 31% of samples for max. at designated beach (>235), 28% of samples for max. at moderately used beach (>298), 17% for max. at lightly used beach (>406), and 15% of samples for max at infrequently used beach (>576) in dry weather months.	54 samples for all the beach usages	6/14/00-10/31/00	San Mateo County Environmental Health Dept. Beach Monitoring
San Vicente Creek (1 sampling site)	San Mateo Coastal Basin	Total and fecal coliform	List	Basin Plan Objectives violated in 3% of samples for total coliform max.(>10,000), 100% of samples for total coliform median (>240), 100% for fecal coliform geomean (>200), 100% of samples for fecal coliform 90 th % ile (>400) (Rec 1) . Basin Plan Objectives violated in 32% of samples for fecal coliform mean (>2000), and 23% of samples for fecal coliform 90 th %ile (>4000) (Rec 2) , in dry weather months.	38 samples for total coliform max., 25 samples for total coliform median, 22 samples for fecal coliform geomean, 22 samples for fecal coliform 90 th %ile, 22 samples for fecal coliform mean.	10/6/98-9/26/00	San Mateo County Environmental Health Dept. Beach Monitoring
San Vicente Creek (1 sampling site)	San Mateo Coastal Basin	E. coli	List	Basin Plan Objectives violated in 100% of samples for max. at all the beach usages in dry weather months.	6 samples for all the beach usages	6/12/00-9/26/00	San Mateo County Environmental Health Dept. Beach Monitoring

Water Body	Hydrologic Basin	Pollutant	Recommended Action	303(d) Listing or De-Listing Rationale	Total Samples	Monitoring Dates	Data Source(s)
San Pedro Creek (9 sampling sites- parking lot, outlet, Linda Mar Blvd, oddstad Blvd, North Fork, South Fork, Middle Fork, Linda Mar Peralta, and Peralta)	San Mateo Coastal Basin	Total and fecal coliform	List	Basin Plan Objectives violated 13% of samples for total coliform max.(>10,000), 98% of samples for total coliform median (>240), 100% for fecal coliform geomean (>200), and 100% of samples for fecal coliform 90 th % ile (>400) in dry weather months.	99 samples for total coliform max., 56 samples for total coliform median, 6 samples for fecal coliform geomean, and 6 samples for fecal coliform 90 th %ile.	5/26/98-8/14/00, 4/24/00-11/13/00	San Mateo County Environmental Health Dept. Beach Monitoring EPA Region IX Laboratory
San Pedro Creek (1 sampling site-Linda Mar Beach, or Pacifica State Beach)	San Mateo Coastal Basin	Total and fecal coliform	List	Ocean Plan Objectives violated 90% of samples for total coliform 80 th %ile, (>1000), 96% of samples for fecal coliform geomean (>200), and 100% of samples for fecal coliform 90 th % ile (>400) in dry weather months.	41 samples for total coliform 80 th %ile., 25 samples for fecal coliform geomean, and 23 samples for fecal coliform 90 th %ile.	5/26/98-8/14/00, 4/24/00-11/13/00	San Mateo County Environmental Health Dept. Beach Monitoring EPA Region IX Laboratory
San Pedro Creek (5 sampling sites- outlet, Linda Mar Blvd, North Fork, Linda Mar Peralta, and Peralta)	San Mateo Coastal Basin	E. coli.	List	Basin Plan Objectives violated 67% of samples for max. at designated beach (>235), 63% at moderately used beach(>298), 57% at lightly used beach (>406), and 54% of samples for max at infrequently used beach (>576) in dry weather months.	54 samples for all the beach usages	5/26/98-8/14/00, 4/24/00-11/13/00	San Mateo County Environmental Health Dept. Beach Monitoring EPA Region IX Laboratory

Water Body	Hydrologic Basin	Pollutant	Recommended Action	303(d) Listing or De-Listing Rationale	Total Samples	Monitoring Dates	Data Source(s)
San Pedro Creek (1 sampling site- beach)	San Mateo Coastal Basin	Enterococcus	List	Basin Plan Objectives violated 40% of samples for max. at designated beach (>104), 40% at moderately used beach(>124), 20% at lightly used beach (>276), and 10% of samples for max at infrequently used beach (>500) in dry weather months.	10 samples for all the beach usages	4/24/00-11/13/00	EPA Region IX Laboratory
San Gregorio Creek near Pacific Ocean	San Mateo Coastal Basin	Total and fecal coliform	List	Basin Plan Objectives violated 2% of samples for total coliform max.(>10,000), 73% of samples for total coliform median (>240), 26% for fecal coliform geomean (>200), and 43% of samples for fecal coliform 90 th % ile (>400) in dry weather months.	56 samples for total coliform max., 45 samples for total coliform median, and 23 samples for fecal coliform geomean and 90 th %ile.	9/28/98-10/31/00	San Mateo County Environmental Health Dept. Beach Monitoring
San Gregorio Creek near Pacific Ocean	San Mateo Coastal Basin	E Coli.	List	Basin Plan Objectives violated 45% of samples for max. at designated beach (>235), moderately used beach (>298), and infrequently used beach (>576). 18% of samples violated at lightly used beach (>406) in dry weather months.	22 samples for all the beach usages	6/12/00-10/31/00	San Mateo County Environmental Health Dept. Beach Monitoring
Pomponio Creek near Pacific Ocean	San Mateo Coastal Basin	Total and fecal coliform	List	Basin Plan Objectives violated 64% of samples for total coliform median (>240), 13% for fecal coliform geomean (>200), and 17% of samples for fecal coliform 90 th % ile (>400) in dry weather months.	44 samples for total coliform median, and 23 samples for fecal coliform geomean and 90 th %ile.	9/28/98-10/31/00	San Mateo County Environmental Health Dept. Beach Monitoring

Water Body	Hydrologic Basin	Pollutant	Recommended Action	303(d) Listing or De-Listing Rationale	Total Samples	Monitoring Dates	Data Source(s)
Pomponio Creek near Pacific Ocean	San Mateo Coastal Basin	E. coli.	List	Basin Plan Objectives violated 5% of samples for all the beach usages in dry weather months.	21 samples for all the beach usages	6/12/00-10/31/00	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at Venice Beach	San Mateo Coastal Basin	Fecal coliform	List	Ocean Plan Objectives violated 13% of samples for Total Coliform (80 th %ile>1000) in dry weather months.	30 samples for Total Coliform 80 th %ile	9/28/98-10/31/00	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at Pillar Point (Pillar Point Harbor, Pillar Point #4, 5, and 7)	San Mateo Coastal Basin	Total Coliform	List	Ocean Plan violated 40% of samples for Total Coliform (80 th %ile>1000) in dry weather months.	143	5/98-10/98, 5/99-10/99, 5/00-10/00	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at Pillar Point (Pillar Point Harbor, Pillar Point #4, 5, and 7)	San Mateo Coastal Basin	Fecal Coliform	List	Ocean Plan Objective violated 9% of samples for log mean (>200) and 35% of samples for 90 th %ile (>400) in dry weather months.	143 for log mean 113 for 90 th %ile	5/98-10/98, 5/99-10/99, 5/00-10/00	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at Fitzgerald Marine Reserve	San Mateo Coastal Basin	Total Coliform	List	Ocean Plan Objective violated 43% of samples for Total Coliform (80 th %ile>1000) in dry weather months.	49	5/98-10/98, 5/99-10/99, 5/00-10/00	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at Fitzgerald Marine Reserve	San Mateo Coastal Basin	Fecal Coliform	List	Basin Plan Objective violated 16% of samples for log mean (>200) and 73% of samples for 90 th %ile (>400) in dry weather months.	49 for log mean, 37 for 90 th %ile	5/98-10/98, 5/99-10/99, 5/00-10/00	San Mateo County Environmental Health Dept. Beach Monitoring

Water Body	Hydrologic Basin	Pollutant	Recommended Action	303(d) Listing or De-Listing Rationale	Total Samples	Monitoring Dates	Data Source(s)
Pacific Ocean at Rockaway Beach	San Mateo Coastal Basin	Total Coliform	List	Ocean Plan Objectives violated 13% of samples for Total Coliform (80 th %ile>1000), dry weather months.	23	5/00-10/00	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at San Gregorio Beach	San Mateo Coastal Basin	Total Coliform	List	Ocean Plan Objectives violated 5% of samples for Total Coliform (80 th %ile>1000) in combined wet and dry weather. (No exceedances between May and October - LISTING DRIVEN BY WET WEATHER ONLY)	76	9/98-3/01	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at San Gregorio Beach	San Mateo Coastal Basin	Fecal Coliform	List	Ocean Plan Objectives violated 8% of samples for Fecal Coliform (90 th %ile>400) in combined wet and dry weather. (No exceedances between May and October - LISTING DRIVEN BY WET WEATHER ONLY)	73	9/98-3/01	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at Surfer's Beach	San Mateo Coastal Basin	Total Coliform	List	Ocean Plan Objectives violated 5% of samples for Total Coliform (80 th %ile>1000) in combined wet and dry weather. (No exceedances between May and October - LISTING DRIVEN BY WET WEATHER ONLY)	134	7/97-1/01	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at Surfer's Beach	San Mateo Coastal Basin	Fecal Coliform	List	Ocean Plan Objectives violated 9% of samples for Fecal Coliform (90 th %ile>400) in combined wet and dry weather. (No exceedances between May and October - LISTING DRIVEN BY WET WEATHER ONLY)	126	7/97-1/01	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at Pacifica State Beach (Linda Mar)	San Mateo Coastal Basin	Total colifom	List	Ocean Plan Objectives violated 22% of samples for Total Coliform (80 th %ile>1000) in wet weather months. (No exceedances between May and October - LISTING DRIVEN BY WET WEATHER ONLY)	36 (wet weather only)	1/98-1/01	San Mateo County Environmental Health Dept. Beach Monitoring

Water Body	Hydrologic Basin	Pollutant	Recommended Action	303(d) Listing or De-Listing Rationale	Total Samples	Monitoring Dates	Data Source(s)
Pacific Ocean at Pacifica State Beach (Linda Mar)	San Mateo Coastal Basin	Fecal Coliform	List	Ocean Plan Objectives violated 19% of samples for Fecal Coliform (geomean>200) and 22% of samples for Fecal Coliform (90 th %ile>400) in wet weather months. (No exceedances between May and October - LISTING DRIVEN BY WET WEATHER ONLY)	36 geomean and 18 90 th %ile (wet weather only)	1/98-1/01	San Mateo County Environmental Health Dept. Beach Monitoring
Pacific Ocean at Baker Beach (mouth of Lobos Creek)	Central Basin	Total colifom	List	Ocean Plan Objectives violated 9.7% of samples for Total Coliform (80 th %ile>1000) in dry weather months.	164 samples	7/1/97-5/29/98	EPA STORET
Peytonia Slough (part of Suisun Marsh Wetlands)	Suisun Basin	DO	List	Basin Plan Objectives (<7mg/l) violate 40.4% of samples	47 samples	7/2/97-5/3/01	Fairfield-Suisun Water Treatment Plant Slough Data June 1997-June 2000, NPDES Permit CA0038024
Suisun Slough (part of Suisun Marsh Wetlands)	Suisun Basin	DO	List	Basin Plan Objectives (<7mg/l) violate 56% of samples	144 samples	7/2/97-5/3/01	Fairfield-Suisun Water Treatment Plant Slough Data June 1997-June 2000, NPDES Permit CA0038024
Boynton Slough (part of Suisun Marsh Wetlands)	Suisun Basin	DO	List	Basin Plan Objectives (<7mg/l) violate 38% of samples	144 samples	7/2/97-5/3/01	Fairfield-Suisun Water Treatment Plant Slough Data June 1997-June 2000, NPDES Permit CA0038024

RATIONALE FOR 2001 PRELIMINARY LIST

Water Body	Hydrologic Basin	Pollutant	Recommended Action	Preliminary List Rationale	Total Samples	Monitoring Dates	Data Source(s)
Lake Merced	San Mateo Coastal Basin	Dissolved Oxygen-Surface	Preliminary List – Review during next Listing Cycle	Basin Plan Objective (>7mg/l) violated 36% of samples at East Lake Spatial, Temporal Coverage inadequate for listing.	14 samples	9/97-12/00	San Francisco Public Utilities Commission Quarterly Lake Monitoring
Lake Merced	San Mateo Coastal Basin	Dissolved Oxygen-15ft depth	Preliminary List – Review during next Listing Cycle	Basin Plan Objective (>7mg/l) violated 64% of samples at South Police Range, 57% at South Pump Station, 93% at North Lake, and 57% at East Lake Spatial, Temporal Coverage inadequate for listing.	14 samples each	9/97-12/00 -	San Francisco Public Utilities Commission Quarterly Lake Monitoring
Lake Merced	San Mateo Coastal Basin	pH	Preliminary List – Review during next Listing Cycle	Basin Plan Objective (>8.5) violated 36% of samples at North Lake Spatial, Temporal Coverage inadequate for listing.	14 samples	9/97-12/00	San Francisco Public Utilities Commission Quarterly Lake Monitoring
Redwood Creek – tidal portion (3 sampling sites)	South Bay Basin	E. Coli	Preliminary List – Review during next Listing Cycle	Basin Plan Objectives violated 33% of samples for max. at designated beach(>235), moderately used beach(>298), and lightly used beach (>406), and 25% of samples for max at infrequently used beach (>576). Temporal Coverage inadequate for listing (only one season).	12 samples for all the beach usages	6/14/00-10/31/00	San Mateo County Environmental Health Dept. Beach Monitoring
Castro Cove	San Pablo Basin	Sediment Toxicity	Preliminary List – Review during next Listing Cycle	Elevated sediment chemistry (ERM quotient) but only one sample, 0 and 33% amphipod survival in 2 samples, significant urchin toxicity in 1 of 3 samples. No benthic analysis conducted. Inadequate ambient data to support listing, but defined as toxic hotspot and remedial plan should be implemented and reviewed.	2 amphipod tox., 3 urchin tox., no benthic samples, 1 sed. chem..	9/94-5/95	Bay Protection and Toxic Cleanup Program (127 sites total)

Water Body	Hydrologic Basin	Pollutant	Recommended Action	Preliminary List Rationale	Total Samples	Monitoring Dates	Data Source(s)
Oakland Inner Harbor – Pacific Dry Dock #1	South Bay Basin	Sediment Toxicity	Preliminary List – Review during next Listing Cycle	Elevated sediment chemistry (ERM quotient), significant amphipod toxicity in 2 of 4 samples, no significant urchin toxicity. No benthic analysis conducted. Inadequate ambient data to support listing, but defined as toxic hotspot and remedial plan should be implemented and reviewed.	4 amphipod tox., 4 urchin tox., no benthic samples, 2 sed. chem..	4/95-4/97	Bay Protection and Toxic Cleanup Program (127 sites total)
Oakland Inner Harbor – Oakland-Fruitvale	South Bay Basin	Sediment Toxicity	Preliminary List – Review during next Listing Cycle	Slightly elevated sediment chemistry (ERM quotient) but only one sample, significant amphipod toxicity in 2 of 2 samples, no significant urchin toxicity.. No benthic analysis conducted. Inadequate ambient data to support listing, but defined as toxic hotspot and remedial plan should be implemented and reviewed.	2 amphipod tox., 2 urchin tox., no benthic samples, 1 sed. chem..	4/95-4/97	Bay Protection and Toxic Cleanup Program (127 sites total)
Central Basin, San Francisco	South Bay Basin	Sediment Toxicity	Preliminary List – Review during next Listing Cycle	Slightly elevated sediment chemistry (ERM quotient) but only one sample, significant amphipod toxicity in 1 of 2 samples, significant urchin toxicity in 1 of 2 samples. No benthic analysis conducted. Inadequate ambient data to support listing, but defined as toxic hotspot and remedial plan should be implemented and reviewed.	2 amphipod tox., 2 urchin tox., no benthic samples, 1 sed. chem..	12/95-4/97	Bay Protection and Toxic Cleanup Program (127 sites total)
San Leandro Bay	South Bay Basin	Sediment Toxicity	Preliminary List – Review during next Listing Cycle	Elevated sediment chemistry (ERM quotient) in 6 of 7 samples, significant amphipod toxicity in 3 of 7 samples, significant urchin toxicity in 3 of 7 samples. Relative benthic index did not indicate significant degradation in any sample (one site, #6, was best in BPTCP). Inadequate ambient data to support listing, but defined as toxic hotspot and remedial plan should be implemented and reviewed.	7 amphipod tox., 7 urchin tox., 5 benthic samples, 7 sed. chem..	4/95-4/97	Bay Protection and Toxic Cleanup Program (127 sites total)

ATTACHMENT D
RESPONSIVENESS SUMMARY

Responsiveness Summary

303(d) Staff Report Response to Comments

California Regional Water Quality Control Board San Francisco Bay Region November 14, 2001

The State Water Resources Control Board (State Board) is considering changes to the State of California 303(d) list of impaired waterbodies in 2002. The nine Regional Water Quality Control Boards including the San Francisco Bay Region (Regional Board) are submitting recommended changes to the State Board. On March 2, 2001, the Regional Board included a notice of solicitation for water quality information and data with its monthly agenda package, mailed to hundreds of individuals and organizations. The deadline for responses was May 15, 2001. The Regional Board staff reviewed all of the information submitted as well as information already planned for review, and drafted a staff report that proposed changes to the 1998 303(d) list for public comment on August 27, 2001, placed on the Regional Board's website for download and emailed to all parties that submitted information by May 15, 2001, as well as other organizations affected by the decisions. Comments on the staff report were due on October 15, 2001 (a 45-day comment period). Comment letters were received from 14 organizations, listed below, and the letters are included as Attachment E of the Board's November 28, 2001 agenda package. Comments received are grouped and summarized below, followed by Board staff's responses.

The draft staff report was revised to respond to a number of comments received. Some valuable additional information was submitted in the letters, below, that changed Board staff's recommendations for a "watch" list, listing, de-listing, or placing certain waterbodies/pollutants on the "watch" list. The comments also provided Board staff useful guidance on where the draft report was vague, erroneous, or confusing. While we have strived to make the process transparent, lacking formal state guidance, the 303(d) listing process this year may be difficult for interested parties to understand. We wish to thank all individuals and organizations, below, that submitted thoughtful and constructive comments and hope that our responses and revisions to the staff report and 303(d) listing recommendations meet with their commensurate respect.

303(d) Comment Letters

<u>Organization</u>	<u>Date of Letter</u>
A. San Mateo Co. Stormwater Pollution Prevention Program	June 27, 2001 ⁹
B. Santa Clara Valley Water District	August 28, 2001 ¹⁰
C. U.S. Environmental Protection Agency, Region IX	September 1, 2001 ¹¹
D. Lake Merritt Institute	September 1, 2001 ¹⁰
E. Pilarcitos Creek Advisory Group	October 10, 2001 ¹⁰
F. City of San Pablo	October 12, 2001
G. WaterKeepers	October 15, 2001
H. WaterKeepers plus other Signatory Env. Groups	October 15, 2001
I. Communities for a Better Environment	October 15, 2001
J. Bayview Hunters Point Community Advocates	October 15, 2001
K. Alameda Countywide Clean Water Program	October 15, 2001
L. City of San Mateo	October 15, 2001
M. Santa Clara Urban Runoff Pollution Prevention Program	October 15, 2001
N. San Francisco Public Utilities Commission	October 15, 2001
O. Alliance for a Clean Waterfront	October 15, 2001
P. Lake Merritt Institute	October 16, 2001

Comment A.1. *San Pedro Creek should not be listed for high coliform count because water contact recreation is not a designated beneficial use, and therefore beneficial uses are not impaired.*

Response: Phone and personal interviews with local residents, as well as visual observations of Board staff, indicate a preponderance of evidence that water contact recreation occurs along San Pedro Creek. Moreover, there is a public beach at the creek's mouth upstream of its confluence with the ocean, where direct contact is common. We support the presumption that water contact recreation is an existing use, attained on or after Nov. 28, 1975, that may not be currently supported due to runoff from urban or horse ranching, or most likely, sanitary sewer overflows. As such, water contact recreation objectives in the Basin Plan are applicable to evaluate attainment of the water quality standard, regardless of whether the Board officially designated water contact recreation. Regional Board legal counsel and U.S. EPA training manuals (Water Quality Standards Academy) support this conservative approach.

Moreover, the analysis of compliance with Basin Plan Objectives in the memorandum is erroneous, applying a single geometric mean or percentile analyses to the entire datasets. The required analysis is much more complicated than portrayed in the memorandum. For

⁹ Memorandum from Paul Randall, EOA, Inc., to Bob Davidson, San Mateo Co. STOPPP recommending that San Pedro Creek not be listed for any pollutants.

¹⁰ Letter sent by email only.

¹¹ Letter sent by email only; U.S. EPA's comments were preliminary, but no further written comments have been received as of November 14, 2001. Comments on San Francisco Bay RWQCB list begin on page 9 of the U.S. EPA letter.

example, fecal coliform geometric means are only valid for 5 samples collected within 30 days for creeks (or 60 days for Ocean Plan standards), necessitating a detailed analysis to determine the number of valid geometric means for comparison to water quality objectives. The same logic applies to 80th percentile and 90th percentile objectives in the Ocean Plan and Basin Plan, respectively. For the water quality assessment, the Regional Board applied this more detailed, accurate analysis, finding widespread impairment during the dry season, and some wet season-only exceedances, as documented in detail in Attachment C of the staff report.

Comment B.1. *The size affected numbers for Alamitos Cr. and Guadalupe River seem to be incorrect. Alamitos Creek is only about 8 miles in length from Almaden Res. to the Guadalupe Creek confluence, where the Guadalupe River begins and flows about 20 miles to San Francisco Bay.*

Response: The numbers in the state's 303(d)/305(b) database tend to be the entire stream length of the mainstem. The size can be changed based on input from the group that is working on the Guadalupe River Mercury TMDL, but statements such as "about 8 miles" are not exact enough to make the change, which ultimately has no prescriptive implication for efforts on the TMDL. In the TMDL, under the Problem Statement element, the refinement of the actual extent of impairment in the Guadalupe River watershed will take place and supersede the general statement of the extent of impairment indicated in the current 303(d) list.

Comment C.1. *Regional Board should consider data from 1997 to assess the last 5 years of data as provided in U.S. EPA's 305(b) guidance.*

Response: The March 2, 2001 public solicitation explicitly states that the Regional Board will consider data generated on or after July 1997. All data sets were evaluated from that date forward, where applicable, and in some cases before that date, where the Board had not reviewed the information in previous listing cycles.

Comment C.2. *Revised standards would not provide a valid basis for the assessment and listing decision process until the revised standards are approved by EPA. Because EPA supports the methodology being used to revise the standards for the South Bay, we would recommend according the TMDLs a low priority.*

Response: Enough technical information exists in 2001 to interpret the narrative toxicity objective, based on an unprecedented and rigorous water effect ratio study, and determine that copper and nickel are not impairing beneficial uses of San Francisco Bay south of the Dumbarton Bridge. Staff recommendation remains to de-list on this technical basis, with Basin Plan amendments scheduled for Spring 2002. The standards revision process is underway, and Regional Board staff resources are committed to achieving this process, and accordingly a de-listing decision can be made on this basis for the 2002 list and adjusted as necessary in the next listing cycle. De-listing at the next 303(d) cycle could be four years away and would lead to a 303(d) list that is technically inaccurate on copper and nickel in South San Francisco Bay between 2002 and 2006. The approach

recommended in this comment sends a confusing message to the public, all on procedural grounds.

Comment C.3. *As noted for some other Regions, the issue of whether a pollutant source is natural is irrelevant to a listing decision unless the State standards provide for a natural sources exemption.*

Response. Comment noted; this rationale was not used in the report as the sole basis for any listing decision.

Comment D.1. *Lake Merritt Institute does not have an ongoing water quality monitoring program, though one is under development. Also, pounds of trash removed are monitored and in 12 years of observations, the lake appears truly enriched with organic matter. Please correct the staff report.*

Response: Changes are made to the staff report. Because all state listings for Low D.O. are accompanied by organic enrichment, Board staff will not deviate from this convention.

Comment D.2. *Please use Alameda County's dissolved oxygen data from 1989-1995.*

Response: As stated in the draft report, we discussed this dataset with Alameda County on the phone and we both determined that it did not contain strong enough information to change the listing status and was also of inadequate coverage to make a listing decision, consistent with the staff report's analysis of the high school data. We are aware of the Lake Merritt water quality committee and encourage the development of a water quality monitoring program through this committee to answer the outstanding questions of spatial and temporal impairment in the lake.

Comment E.1. *Pilarcitos Creek Advisory Committee (PCAC) recommends that the creek be listed as impaired by sediment based on information contained in "Sediment Transport Reconnaissance of the Pilarcitos Creek watershed, Water Year 2001," by Balance Hydrologics, Inc. This report was published shortly after the draft 303(d) revisions report, and PCAC believes that the data contained in the report substantiate that Pilarcitos Cr. is sediment impaired and meets the criteria described in the draft staff report.*

Response: As indicated in the draft staff report on page 23, we recognize the PCAC as a broad and knowledgeable stakeholder group in the watershed. The rationale for a preliminary listing includes recognition of existing (or needed) assessment efforts that should drive the decision to list on the impaired waterbodies list. At the time of the final staff report, staff has not had time to review the new technical report published in September 2001, well after the May 15, 2001 deadline for new water quality information. We believe that our recommended preliminary list status affords a level of protection to the Pilarcitos Creek watershed commensurate with activities underway to assess and rehabilitate the watershed, and that Regional Board review of those activities at the next

listing cycle will support a decision to list or not to list the creek as impaired by sedimentation/siltation.

Comment F.1: *The City of San Pablo strongly disagrees with the proposal to include Wildcat and San Pablo creeks, within the city limits, on the list of urban waterbodies where trash threatens to impair water quality (i.e., the Board’s “watch” list). The City of San Pablo has implemented a number of measures to successfully prevent and remove trash from these creeks. As evidence, the city has provided summaries of inspection, cleanup, preventive, and public education measures in which the City is involved.*

Response: We concur that the City of San Pablo has already been providing leadership in control and abatement of trash discharges. It is this very reason that the Board proposes placing all urban creeks, lakes and shorelines on its “watch” list, the preliminary list, in lieu of the impaired waterbodies list. This approach will allow municipalities the opportunity to provide the Board a better assessment of spatial and temporal extent of trash occurrence and use a defensible assessment methodology to determine impairment due to trash, rather than presence/absence on a given day at a given site, which besides Coastal Cleanup and National River Cleanup data, is all the Board had to review during this listing cycle.

The Regional Board staff is grateful to the City of San Pablo for the detailed submittal in response to our draft 303(d) report, and applauds the City of San Pablo for raising community awareness and removing pollution from its waterbodies. We have noted the challenge you mentioned of balancing public access with observed levels of trash in the creeks, where trash levels appear to decline when fences are erected to exclude the public, which hopefully is not the ultimate solution to managing trash discharges.

Notably, the City mentions, “noting continuous improvements in the quality of the creeks” and your photos provide snapshot evidence of trash-less conditions after cleanup efforts. Your comments underscore the need for the Regional Board and cities to work together regionally to (a) establish baseline conditions (perhaps as long as 7 years ago when efforts began in earnest), and (b) agree on a methodology to note continuous improvement, due to the diffuse nature of this pollutant. We encourage your input to these discussions as they occur in the processes of stormwater program annual report review and compliance status determination.

Using its existing regulatory authority under the stormwater NPDES permits, the Board intends to review annual reports from stormwater programs, in monitoring sections, to identify trash hotspots in cooperation with municipalities. These reviews will guide the Board on where to make impairment determinations in the next listing cycle. Keep in mind, however, that a discussion topic in the coming years will be the measurement “trash removed.” If “trash removed” is a high magnitude, it reflects well on abatement efforts of cities and volunteer efforts, but it signifies an ongoing impairment with respect to preventing the trash from being discharged to waters of the State in the first place, which is prohibited by the Basin Plan. For instance, Lake Merritt is listed as impaired by trash, and the high magnitude of trash removed on a regular basis provides strong

evidence of ongoing impairment, even though the City of Oakland and others diligently remove the trash from the waterbody in good faith. The impairment listing is not punitive to the City of Oakland, but rather provides them a basis to develop a plan (which can be called a TMDL) to prevent trash from entering the waterbody.

Comment G.1: *Board staff should convene a public workshop to air concerns over its proposed list and explain its reasoning for excluding scores of polluted waterbodies. No rationale is given for ignoring many studies submitted to the Board in support of listing.*

Response: Given the volume of information reviewed and staff resources, it is not possible to explain every decision for every waterbody (>100) in the report text. We believe we provided adequate rationale in the draft report to support every decision to list or not to list. Nevertheless, we added a section to the report, “Decisions to Not List,” at page 17 to assist the interested public in understanding application of the rationale to specific sets of data called out in public comments received.

The Regional Board’s recommendations to the State Board are not required to be a public process. The public process occurs at the statewide level, estimated to occur in April 2002. Nevertheless, the Regional Board staff purposefully solicited input on its recommendations in order to better represent the overall public interest in its recommendations for the State Board. Because these recommendations can be accepted or rejected by State Board or U.S. EPA in subsequent public and administrative processes, there will be no additional workshop. All written comments received will be forwarded to the State Board along with the Regional Board’s recommendations. Public comment will be accepted at the November 28, 2001 Board meeting and consideration of a tentative resolution to transmit the recommendations to the State Board.

Contrary to the comment, rationale was explained in the draft report under the section “Approach to Listing Waters,” with special attention to issues of Basin Plan Criteria, California Toxics Rule, Sediment, and Trash. This section of the report has been augmented to respond to comments. Additionally, the commenter failed to acknowledge that Board staff and interns personally met with WaterKeepers for three hours on July 10, 2001 and explained its reasoning for not listing every waterbody/pollutant combination requested by WaterKeepers. Board staff “disagreement” with WaterKeepers’ interpretations is not “ignoring.”

A great number of the waterbodies/pollutants suggested by WaterKeepers are technically already listed for the pollutants, whether they are toxic hotspots with elevated chemicals in sediments (mercury, PCBs, DDT, dieldrin, chlordane, etc.) that are part of listed waterbodies (e.g., these pollutants in San Francisco Bay, Central; San Pablo Bay; etc.), or tributary to listed waterbodies and therefore automatically captured in subsequent TMDL processes (e.g., San Antonio Creek/sediment or nutrients, ammonia; tributary to Petaluma River which is already listed for sediments, nutrients). The draft staff report states the rationale for tributary-based listings on page 4, which prevents unnecessary proliferation of TMDL processes that are obviously interrelated. WaterKeepers’ suggested listings would result in a fragmented, ineffective management scheme for the straightforward

reasons stated on page 4, which their comments appear to ignore. The idea that more listings in a given set of tributaries afford more water quality protection has no basis in reality.

Because the rationale has been provided, and apparently overlooked by the commenter, the Regional Board does not have to provide a defense for each waterway that is not recommended for listing. There are over 300 waterbodies in the Basin Plan, and defending a decision not to list for 300 waterbodies and over 15 classes of pollutants is too much workload for too little environmental protection. The Regional Board provided rationale for listing and de-listing recommendations. The Regional Board staff reviewed all submittals and reviewed additional information, such as the Regional Monitoring Program, and watershed monitoring by drinking water agencies and U.S. Geological Survey.

The Regional Board can not legally recommend listing a waterbody and pollutant based on sediment concentrations, due to lack of sediment quality objectives. In response to this and other comments, including internal staff comments, the Board staff will recommend listing certain toxic hotspots as impaired due to the documented effects: sediment toxicity and benthic community effects (see report revisions under Bay Protection Program and Tables 4 and 5, pages 23 and 36 in particular).

Comment G.2: *The proposal to de-list the San Francisco Bay, North of the Dumbarton Bridge, for copper and nickel is premature.*

Response: Years of data collected under the Regional Monitoring Program, augmented by data collected in the shoal areas of San Pablo Bay in the past year, together provide an overwhelming case that copper and nickel levels in the main water mass areas consistently comply with applicable California Toxics Rule water quality objectives, which are dissolved (see Attachment C for number of data points and exceedance frequency). Some parties argue that the proposal is overdue.

However, we agree that copper and nickel need to remain on the “watch” or threatened list because ambient values are within an order of magnitude of applicable objectives, and aggressive pollution prevention efforts must remain in force throughout the Bay Area in order to prevent ambient copper and nickel values from increasing and violating the antidegradation portion of the Bay’s water quality standard. Moreover, the mouth of the Petaluma River consistently shows exceedances of the California Toxics Rule criteria for copper and nickel, correlated with increased total suspended solids (TSS) in the water column, and raises questions about compliance in freshwater/saltwater interfaces and actively dredged channels such as the tidal Petaluma River. The Board is recommending listing of this portion of the Estuary as impaired by copper and nickel.

We have added discussion of actions that need to happen (page 31-) to prevent increases in ambient copper and nickel. Any statistically significant increases would violate the antidegradation portion of the water quality standard and trigger listing.

Comment G.3: *The Draft 303(d) list should not arbitrarily exclude wet weather data when evaluating coliform and E.coli contamination.*

Response: We agree that wet weather information is valid for ocean monitoring, due to the presence of the beneficial use, and have revised the listing that specifies which beaches are impaired during wet weather months only. We maintain that wet weather bacterial indicators can be misleading, based on a century of research in this arena, and therefore do not recommend their use for waterbodies other than the ocean. Wildlife and soil bacteria trigger coliform-based impairment findings and can have no correlation with actual pathogenic risk. Moreover, persistent coliform or E. coli levels in dry weather provide a clearer signal that an anthropogenic discharge is present, and the Regional Board can better defend such listings on a technical basis, effectively targeting resources toward problems that actually exist and can be solved. Contrary to the comments, the data indicate that Pescadero Beach is not impaired at any time.

Comment G.4. *The Draft Report fails to include several waterbodies impaired by trash.*

Response: The report responded to the information provided by the commenter and elevates trash as a pollutant of concern to the public, and the Board. The water quality information submitted by WaterKeepers on behalf of other public organizations triggered significant staff activity investigating region-wide information for trash removal, in order to provide a defensible rationale for assessment at this time with existing information. After this effort we concluded that existing information is not collected in a way to justify impairment listing.

See Comment F.1 and response for the urban runoff program perspective.

Trash is officially on the “watch” list for all urban waterways, and staff is committed to reviewing annual stormwater program reports to identify assessment methods and hotspots to make defensible listing decisions in the next listing cycle. The commenter has failed to provide adequate information to justify any impairment listing. One photograph or video taken on one day does not represent spatial or temporal variability over the last 5 years, and other commenters, while acknowledging trash is worthwhile to address, have effectively dismissed this snapshot methodology. The staff report is clear that impairment findings must be based on persistent, waterbody-wide conditions. The staff report has been edited to remove the stormwater programs’ rationale that technology has not been implemented yet – rather, there is a program in place that should be preventing trash from entering waterbodies, but there are not adequate data available to determine whether it is working. Notably, the City of San Pablo objects to their creeks being listed on the “watch” list because of their consistent efforts and reduction of wastes entering the Bay as a result. In sum, recommendations for any listings would be counterproductive at this time.

Comment G.5: *The draft report unlawfully proposes to avoid listing Bay Area creeks for sediment.*

Response: The draft report provided adequate explanation why sediment-related impacts do not equate to a finding of impairment. Moreover, the report provided an example, Corte Madera Creek, where reduction of sediment inputs to the stream, triggered by any TMDL action, would actually harm beneficial uses. In the case of Novato Creek, actions underway may unveil that the water quality standard is attained within the next listing cycle, and therefore a “watch” list status is justified at this time. By placing it and Pilarcitos Creek on the “watch” list, we acknowledge that an impairment finding may be justified at a future listing, pending more information to see whether or not a management action underway has provided the assessment information and/or corrective action that is warranted to protect water quality.

Comment G.6: *The draft report arbitrarily concludes that certain data are too old to use for listing numerous creeks contaminated with heavy metals.*

Response: This comment is misleading. The March 2001 public solicitation provided that the Board would consider data before July 1997 that it had not considered in past listing recommendations. State Board advised Regional Boards to not consider any data before July 1997, but Regional Board staff purposefully left this option available, and the listing recommendations in Attachment C include data before July 1997.

The commenter submitted these heavy metals data in the previous listing cycle and the Board already considered them, and found them to be inadequate to justify listing. A new section has been added to the staff report at page 17 reiterating the rationale, especially in light of the California Toxics Rule which established dissolved criteria for metals except mercury and selenium.

This is not to say that the Board is not interested in metals in urban runoff, both as contributors to the Bay and in the creeks themselves. As is noted in the additions to the report (page 17), the infrequent (~4%) exceedances of the copper and zinc acute (1-hour) criteria do raise questions of water quality protection and highlight monitoring objectives for these pollutants for stormwater programs, as indicators of potential impairment. For a listing recommendation, however, the exceedances must be persistent and waterbody-wide, as described in the staff report under “Approach to Listing Waters.”

Comment H.1 – Same as G.2 (Premature to de-list copper and nickel for San Francisco Bay segments)

Comment H.2 – Same as G.1 (No rationale given for “ignoring” studies submitted to the Board)

Comment H.3 – Same as G.3 (Wet weather coliform)

Comment H.4 – Same as G.4. (Trash) See also comment/response F.1 for a city’s urban runoff program perspective.

Comment H.5 – Same as G.5 (Sedimentation)

Comment H.6 – Same as G.6 (Metals in stormwater runoff, 1988-1995)

Comment I.1: *The staff report correctly identifies polybrominated diphenyl ethers (PBDEs) as pollutants of concern but defers action by not recommending listing, inconsistent with the precautionary principle and other criteria.*

Response: We agree that PBDEs are of significant concern, and acknowledge Communities for a Better Environment (CBE) for bringing attention to the matter in 2000, but absent numeric objectives, impairment findings can not be defended at this time. By placing the PBDEs on the “watch” list, the Regional Board staff will steer the Regional Monitoring Program to prioritize the pollutant for monitoring and already the Bay Area Pollution Prevention Group, composed of municipal dischargers, have proposed a pollution prevention project for PBDEs for fiscal year 2001-02, thanks in part to efforts of local researchers, CBE and the Regional Board’s statement that PBDEs are increasing and threaten to impair water quality.

Comment I.2: *Narrative criteria, additive toxicity, and synergistic toxicity. The staff report’s analysis of the potential for violations of narrative water quality (objectives) due to combinations of pollutants is missing and/or inadequate. Eljarrat et al. (2001) provides clear evidence of the potential for PAH compounds to exacerbate the toxicity of dioxins and certain PCBs.*

Response: The current water quality assessment framework is not equipped to address additive or synergistic effects, other than to list waterbodies for multiple pollutants and/or effects-based listings. In the case of San Francisco Bay segments, multiple pollutants are listed including PCBs and dioxins cited by the commenter, and the draft report has been revised to specify nine toxic hotspots where adverse effects are clearly documented and linked to pollution (four are recommended for listing, five for “watch” list status).

The recent article furnished by the commenter from the scientific journal Environmental Science and Technology by Eljarrat et al., as well as some of the references in that article, provide mounting evidence that PAHs exhibit dioxin-like toxicity at greater levels than dioxin, based on the actual sediment concentrations observed in Mediterranean Spain. That article demonstrated that the dioxin “toxic equivalents” of the PAHs were orders of magnitude higher than the dioxins themselves, suggesting that PAHs were perhaps more deleterious than dioxins at the ambient concentrations observed. The draft 303(d) report was revised to include this recent article as further justification for recommending PAHs on the “watch” list, even though California Toxics Rule criteria for PAHs are consistently met in RMP water samples.

Comment I.3: *PAHs should be listed, because of the potential to contribute to the toxicity of dioxins and certain PCBs, and additive/synergistic toxicity. The draft seems to conclude that the proposal not to list PAHs, in absence of an analysis of additive/synergistic toxicity, is a close call.*

Response: See response to I.2. Generally, we agree that listing PAHs is a close call, and that we prefer to make a finding of “threatened impairment” recognizing the limitations of the CTR criteria, and focus Regional Monitoring Program and other discharger monitoring resources on more assessment, particularly in near shore areas more influenced by urban discharges laden with PAHs. A blanket listing of San Francisco Bay segments on the current data is impossible to justify without inferences on additive/synergistic toxicity we presently can not defend with data from San Francisco Bay. We have revised the draft report to include more specific expectations for further assessment for better decision making in the next listing cycle.

Comment I.4: *Copper and nickel should not be de-listed because (1) copper toxicity may cause effects in the open ocean below concentrations found in the Bay, (2) dissolved copper concentrations in the Bay appear elevated above less urbanized estuaries, and (3) species believed most vulnerable to copper toxicity are reduced in abundance in parts of the Bay with the highest sustained copper levels (Coale, 1991; Luoma, 1992; Karras 1992).*

Response: Water quality objectives for copper and nickel are consistently met in the hundreds of samples taken north of Dumbarton Bridge, and decrease significantly in a gradient leading toward the ocean. Chelating chemicals in effluent such as EDTA bind copper and render it non-toxic, and this is one reason areas of the Bay that have the highest sustained levels of copper, due to effluent and urban runoff, do not exhibit toxicity to test organisms at levels above the national water quality criterion of 3.1 ug/l, dissolved. The evidence collected in the last decade, reviewed by many stakeholders, supports the conclusion that relatively elevated copper in this urbanized estuary is not impairing water quality or beneficial uses. Board staff have responded to and upheld the challenge that there may be copper-sensitive organisms missing from the southern estuary, but a causal link could not be established. There will be opportunity to comment on the Board’s Basin Plan amendment in Spring 2002 on the proposed site-specific objectives for copper and nickel, south of the Dumbarton Bridge.

This comment underscores the need to remain vigilant and control sources of copper and nickel to the estuary. If ambient levels increase, these pollutants will be re-listed on the basis of antidegradation. In the meantime, they remain on the “watch” list at least through the next listing cycle, to answer questions raised by elevated levels consistently recorded at the actively dredged, freshwater interface station at the mouth of the Petaluma River.

Comment I.5: *Dioxins and dioxin-like PCBs should be listed as high priority ranking, based on input from U.S. EPA.*

Response: Dioxins, furans, and dioxin-like PCBs are a high priority for pollution prevention, but the Board and its staff do not believe it is a high priority for TMDL development, which is what the 303(d) list communicates. Nonetheless, the infrastructure needed to create a technical TMDL for dioxins and related pollutants will be developed for the mercury and PCB TMDLs (persistent, bioaccumulative pollutants

with significant atmospheric and runoff sources), under development, providing the technical structure needed to establish and implement TMDLs for these pollutants, as well as chlorinated pesticides. In other words, the same preparatory work for a dioxin TMDL as for a PCB TMDL is already underway.

Comment J.1: *We are strongly dismayed by the environmental injustice of (removing Islais Creek from the 303(d) list) and insist that Islais Creek and Yosemite (Creek) be added to the 303(d) list.*

Response: Islais Creek was never on the 303(d) list, so any allegations of environmental injustice are unfounded. In addition to comments received by interested parties, Regional Board staff have internally discussed the appropriate technical approach to addressing Bay Protection and Toxic Cleanup Program (BPTCP) sites in the 303(d) context, absent sediment quality objectives. We concur that the weight of evidence at Islais Creek as well as 3 other toxic hotspots in the Bay Area warrant inclusion on the 303(d) list for effects-based stressors, sediment toxicity and benthic community impacts, because of the scientific rigor of the statewide program. The data in the BPTCP do not support a listing of Yosemite Creek on this basis, although more data collection in the area, conducted by the City and County of San Francisco, could lead to a similar finding in the future. These data from the City and County were not “readily available” for the current listing cycle.

Comment J.2: *The 303(d) proposal has been made without any community involvement or consultation. A meeting should be held in the Bayview Hunters Point community prior to making any decisions regarding issues affecting the people or environmental of its neighborhood.*

Response: There appears to be a significant misunderstanding by the commenter of the 303(d) process, mediated by miscommunication by WaterKeepers. This comment is rooted in the misconception that Islais Creek was ever on the 303(d) list. This year’s process has been unprecedented in the amount of public input considered, extending from March 2001 to the present, and two open public processes of input and comment. With current staffing on this process (less than one staff person), holding of community meetings in over 100 cities regarding over 300 waterbodies is simply not possible. We welcome this comment letter and input from the community, but the discussion must be centered on scientific-based evidence of water quality impact and not general assumptions of impact, which are all the comment letter provided. Fortunately, the 303(d) list already contains pollutants of concern for the community for the entire San Francisco Bay, which includes Islais Creek and Yosemite Creek which are tidal, and pollutants such as PCBs and mercury that are contained in sediments near the community will be considered in overall TMDL plans to reduce contaminant levels in fish tissue. Therefore, the Regional Board has the community’s interests well in mind, in case the Advocates were not aware of this process already underway.

Comment J.3: *The Bayview Hunters Point Community Advocates respectfully request that it be added to all Board notification lists regarding activities in San Francisco.*

Response: Staff will add your organization and address to the monthly Agenda mailing list, which currently contains hundreds of individuals, agencies and organizations, so that you may more closely monitor agenda items and decide which ones to track. We recommend you use our website www.swrcb.ca.gov/rwqcb2 as a convenient way to track agenda items, which are downloadable up to two weeks before each monthly meeting.

Comment K.1: *The Regional Board should retain and formalize the Threatened Impairments to Water Quality List, recommended by the National Research Council (NRC), and we recommend that this new approach be established in a formal policy/resolution of the Regional Board, allowing an opportunity for all of the affected parties to comment on this new approach and for the Regional Board to formally adopt the approach. We do not agree, based on the NRC report, that a rotating basin approach would take one listing cycle, and that listings would be automatically triggered, as stated in the draft report.*

Response: We agree that a policy (and perhaps federal regulation) should be developed for a watch list, but not at a decentralized Regional Board level. For the time being, we only recommend approaches consistent with the NRC report, and will only specify a default future listing for those cases where there are adequate data to find impairment now, and we defer listing decisions based on allowing a regulatory program to be assessed for its ability to control that pollutant (i.e., trash and bay protection sites). For the Regional Board's 2002 303(d) recommendations, this is the public process for comment on what is actually an "interim" approach to the preliminary "assessment" or "watch" list.

We agree that the NRC report anchors the listing decisions related to the preliminary list in a five-year rotating basins approach, and the staff report has been corrected to reflect consistency with the NRC report at page 27.

Comment K.2: *Proceed with the de-listing of copper and nickel.*

Response: Comment noted.

Comment K.3: *Based on Alameda Countywide stormwater program's experience, the increased emphasis on better controlling trash is worthwhile. The staff report needs to provide more specificity to trash listing on "watch" list. For instance, which urban shorelines are threatened?*

Response: Draft staff report stated that urban shorelines, not defined in the Basin Plan, would be defined in consultation with stakeholders and not at this time.

Comment K.4: *What are criteria that Regional Board staff used in noting excessive levels of trash during field reconnaissance?*

Response: Staff make visual observations and draw site maps at >80 monitoring sites of the California Surface Water Ambient Monitoring Program, including trash observations.

We have removed the adjective “excessive,” because of the vagueness of the term. The Basin Plan Prohibition No. 7 could be interpreted that any trash in a waterbody is excessive.

Comment K.5: *Other questions regarding trash that need to be answered include: Which of the municipal stormwater programs’ current performance standards for trash meet best available technology to control trash discharges, or do the performance standards need to be modified? How much trash originates from the discharge of stormwater versus the direct deposition or windblown accumulation of trash onto local waters or floodplains? How are different types of trash evaluated in terms of their potential impacts to beneficial uses?*

Response: These outstanding questions are part of why it is premature to list waterbodies in the San Francisco Bay Region as “impaired” by trash, and provide discussion topics to assist in development of defensible assessment methodology.

Comment K.6: *The Regional Board should recognize the need to refine beneficial use determinations (designations). If urban creeks are to be added to the Basin Plan in the near future, as stated in the draft staff report, we believe it will be increasingly important to recognize finer distinctions of beneficial uses than currently provided in the Basin Plan, given the complexity of the creek systems with relatively intact headwaters and highly altered main stems. Seasonal uses may be appropriate for ephemeral creeks or sections of creeks and use attainment and impairment findings need to be realistic for urban creeks. There are issues of existing or designated uses as defined by 40 CFR 131.1, and how impairments are determined.*

Response: Comments noted.

Comment L.1: *The City of San Mateo requests that the Regional Board consider delaying the addition of Marina Lagoon to the 303(d) list. Although water quality objectives are exceeded, further research should be conducted to determine whether the beneficial use of Marina Lagoon is impaired.*

Response: The commenter misunderstands the 303(d) list. If water quality objectives are exceeded, as is clearly the case in Marina Lagoon during dry weather, and beneficial uses exist, which is also clear based on designated public access and swimming areas where data are collected, then the waterbody must be listed, and the Regional Boards and State Boards do not have any flexibility to delay listing based on planned studies. The studies and corrective actions the City plans may result in monitoring data that demonstrates compliance with the water quality standard, and then the Marina Lagoon may be subsequently de-listed before a TMDL has to be developed.

Comment M.1: *The Santa Clara stormwater program concurs with the de-listing of copper and nickel for San Francisco Bay south of the Dumbarton Bridge.*

Response: Comment noted.

Comment M.2: *We believe the Regional Board needs to develop a formal policy for the threatened listings (the “watch” list).*

Response: See response to comment K.1, above.

Comment M.3: *We disagree with staff’s default position to list where data are not available.*

Response: The staff report has been corrected to be aligned with National Research Council recommendations, also see response to Comment K.1 and removal of default listing language throughout the section of the staff report entitled “Threatened Impairments to Water Quality.” We agree that a default listing can not occur where data are not available, but certain listings may be triggered in absence of new assessment information, based on currently available information.

Comment M.4: *We support the staff recommendation on trash.*

Response: Comment noted.

Comment M.5: *Remove diazinon from the 303(d) list and place it on the threatened (or “watch”) list.*

Response. Staff does not agree with the logic behind this recommendation and the staff report has been augmented with a discussion that responds to this comment at page 20.

Comment N.1: *San Francisco Public Utilities Commission requests that Lake Merced be removed from the “watch” list and that the Baker Beach listing for high coliform count be changed to Lobos Creek.*

Response: The rationale offered by the commenter to exclude Lake Merced from the dissolved oxygen and pH “watch” listings are inconsistent with the rationale outlined in the staff report, namely, to evaluate ambient data based on Basin Plan objectives. Monitoring of the lake must be more comprehensive than suggested in the comment letter, and Board staff will work with the PUC to develop a monitoring plan that answers questions of water quality impairment.

The fact that the source of the bacterial contamination of Baker Beach, via Lobos Creek, is unknown to the PUC is not adequate basis to shift the impairment from the beach to the creek, since the beneficial use exists at the beach. If anything, the comment provides a basis for listing both waterbodies, as has been done at locations along the San Mateo Coast where data from creeks were analyzed. Since no data are readily available for Lobos Creek itself, and that it has been inferred as a source based on ocean monitoring locations by the PUC, we will defer a listing decision on Lobos Creek pending the investigations that will be forthcoming as a result of the Baker Beach listing. As shown in Attachment C, the exceedance frequency of Ocean Plan total coliform standards is

fairly low (9.7%) and therefore we believe that this water quality impairment can be understood and solved by the next listing cycle (e.g., through investigations of shorebird non-pathogenic contributions to total coliform levels). We are grateful for the PUC's willingness to work with the Presidio and others to ascertain the sources of elevated bacteria conveyed by Lobos Creek, and bring Baker Beach into compliance with the water quality standard.

Comment O.1: *Alliance for a Clean Waterfront believes Mission Creek and Islais Creek warrant inclusion on the impaired waterway (waterbodies) list. Yosemite Creek also merits review by the Regional Board.*

Response: In addition to this and other comments, and internal staff comments, we concur that Islais and Mission Creeks belong on the impaired waterbodies list for sediment toxicity and benthic community effects. Yosemite Creek data from the Bay Protection Program was also re-considered. See Response to Comment J.2 and the new sections of the staff report entitled Bay Protection and Toxic Cleanup Program, to understand Board staff's rationale related to evaluation of contaminants in sediment and biological effects. Contrary to the commenter's assertion, standards are not exceeded for heavy metals, PAHs, and enriched H₂S and NH₃, because sediment quality objectives do not exist – this was the reason that Bay Protection data was not used to recommend listing pollutants in the draft report – it would be overturned on procedural grounds.

Comment O.2: *High quality data were not used to make findings of impairment.*

Response: See new section of report entitled "Decisions to Not List." High quality data may not be adequate to list if there are no exceedances of water quality objectives.

Comment O.3: *The draft report is inadequate. Public input was solicited but not included or responded to in the draft. The issue of environmental justice must also be factored into the criteria.*

Response: The draft report has been revised based on comments received and Appendix A contains a comprehensive list of data and information received and reviewed by the Regional Board staff. We do not agree with the assertion that environmental justice issues, which require a socio-economic overlay outside of the scope of the Regional Board's authority, should weight evaluation of water quality standards. Any environmental justice issues are self-evident when these disparate disciplines are analyzed conjunctively.

Comment O.4: *Please include our organization on your mailing list for future notices on this issue.*

Response: Your organization and address will be added to the Board's Agenda mailing list. See response to J.3.

Comment P.1: *Since the term trash is neither employed in the Basin Plan nor defined in the Clean Water Act, please clarify if there will be any change in terms of enforceability with the use of this term.*

Response: California's statewide 303(d) list consistently uses trash to describe floatable and settleable debris. Los Angeles Regional Board adopted a TMDL for Trash that received a 2001 Governor's Award. There is no change with the use of this term.

Comment P.2: *Lake Merritt Institute believes that organic enrichment listing should remain coupled with low dissolved oxygen based on visual observations. Please clarify what assessment methodology is required to support an organic enrichment listing.*

Response: We reviewed the statewide listing and found that the State Board always couples organic enrichment with low DO listings, and have removed this recommendation from the staff report, and will place Lake Merritt Low DO/Org. enrichment on both the 303(d) list and the "watch" list, since U.S. EPA's 1998 listing was not based on adequate data, based on their own guidance. The commenter misunderstands the Board staff concern about U.S. EPA's ad-hoc decision to list Lake Merritt in 1998. The commenter failed to provide adequate information to support a listing – the presence of organic matter in sediments needs to be compared against a threshold or range that would affect DO. The mere presence of organic matter or anaerobic degradation in leaf-rich sediment is not impairment – in fact it may benefit aquatic life, depending on a host of factors. A number of assessment methodologies would suffice to support an organic enrichment listing – in 1998 there were none cited, and raw data cited by the commenter is not an assessment.

Comment P.3: *Lake Merritt Institute requests that the Regional Board consider how the problem of petroleum and hydrocarbon based pollutants within the Lake should be addressed as part of the 303(d) listing process.*

Response: Comment noted. As explained in Approach to Listing Waters, the Regional Board needs evidence of persistent, waterbody-wide conditions that violate a water quality standard.

Comment P.4: *Please clarify how the municipal stormwater program's statements that "best available technology for trash control may not have been implemented yet" can be reconciled with other statements as well as Regional Board findings regarding BAT for removal of trash from stormwater discharges in NPDES proceedings before the Regional Board.*

Response: After internal discussion, this portion of the draft report has been eliminated. See also response to Comment G.4.

ATTACHMENT E

PUBLIC COMMENTS ON DRAFT 303(D) STAFF REPORT